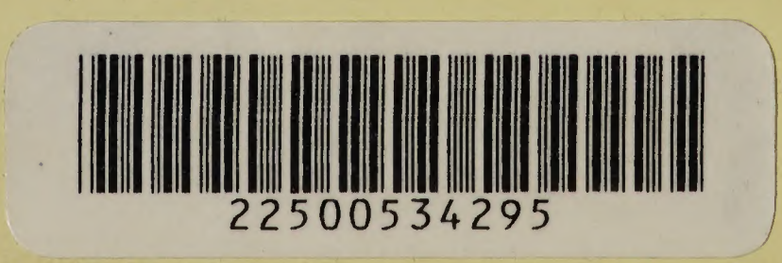
Proceedings
&
List of Members.

1892.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Anatomical Society of Great Britain and Ireland.

LIST OF MEMBERS.

Abraham, Phin. S., 29, Upper Montagu Street, W.
Allingham, Herbert, 25, Grosvenor Street, Grosvenor Square, W.
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Lane, W. Arbuthnot, 14, St. Thomas's Street, S.E.
Langton, John, 2, Harley Street, W.
Lockwood, C. B. (*Sec. for England*), 19, Upper Berkeley Street, W.
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Page, Herbert William, M.B., 146, Harley Street, W.
Paterson, A. M., Owens College, Manchester.
Pick, Thomas Pickering (*Council*), 18, Portman Street, W.
Poland, John, 16, St. Thomas's Street, S.E.
Power, D'Arcy, 26, Bloomsbury Square, W.C.
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Robertson, Charles, Museum, Oxford.
Rolleston, H. D., St. Bartholomew's Hospital.
Roughton, E. W., M.D., St. Bartholomew's Hospital.
Shattock, S. G., St. Thomas's Hospital, S.E.
Shore, T. W., M.D., Physiological Laboratory, St. Bartholomew's Hospital. E.C.
Sibley, Walter, 7, Harley Street, W.
Stewart, Prof. Charles (*Treasurer, Council*), Royal College of Surgeons, Lincoln's Inn Fields, W.C.
Stiles, H. J., M.B., Demonstrator of Anatomy, The University, Edinburgh.
Stoker, Prof. Thornley (*Sec. in Ireland*), 16, Harcourt Street, Dublin.
Stonham, C., 62, Welbeck Street, W.
Struthers, Prof. (*Vice-President*), Anatomical Department, The University, Aberdeen.
Sutton, J. Bland, 22, Gordon Street, Gordon Square, W.C.
Symington, Johnson (*Council*), 2, Greenhill Park, Edinburgh.
Thane, Prof. (*Council*), University College, Gower Street, W.C.
Thomson, Arthur, M.B. (*Council*), The Museum, Oxford.
Treves, F. (*Council*), 6, Wimpole Street, Cavendish Square, W.
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Turner, Sir William, F.R.S. (*Council*), 6, Eton Terrace, Edinburgh.
Walsham, W. J., 27, Weymouth Street, W.
Willett, Edgar, 60, Welbeck Street, Cavendish Square, W.
Windle, Prof. B. (*Council*), Queen's College, Cambridge.
Wood, John, F.R.S. (*Vice-President*), 61, Wimpole Street, W.
Young, Prof. (*Council*), Owens College, Birmingham.
Young, R. Bruce, M.A., M.B., Demonstrator of Anatomy, The University, Glasgow.

TO BE PROPOSED FOR ELECTION IN NOVEMBER.

Purser, John Malet, Professor of Institutes of Medicine, Trinity College, Dublin.

Scott, J. Alfred, F.R.C.S.I., Lecturer on Physiology, Carmichael College, Dublin.

Heuston, Francis, F.R.C.S.I., Lecturer on Anatomy, Carmichael College, Dublin.

Redfern, Prof., Queen's College, Belfast.

Bennett, E. H., M.D., Professor of Surgery, University of Dublin.

Campbell, William S., 66, Wimpole Street, W.

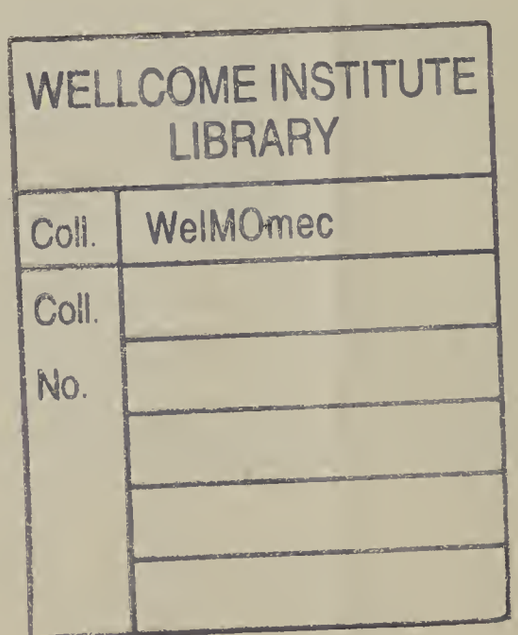
Pye, Prof., Professor of Anatomy, Queen's College, Galway.

Chambers, James, M.D., Demonstrator of Anatomy, Queen's College, Belfast.

Griffith, Thomas Wardrop, Professor of Anatomy, Yorkshire College, Leeds.

Long, Sinclair, Demonstrator of Anatomy, Royal College of Surgeons of Ireland; Manor House, Rundrum.

Bermingham, Ambrose S., M.B., Lecturer on Anatomy, School of Catholic University, Dublin.



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PROCEEDINGS OF THE

ANATOMICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

An Ordinary Meeting of this Society was held at the Rooms of the Medical Society of London, Chandos Street, W., on Thursday, July 7, at 4 p.m.—Professor Humphry, F.R.S., in the chair. The following Rules were adopted :—

1. Those interested in the science of Anatomy shall be eligible for election as Members of the Anatomical Society of Great Britain and Ireland.
2. Candidates shall be proposed by three members, of whom one shall have personal knowledge of the Candidate.
3. The name and address of each Candidate, together with the names of his proposers, shall be announced at a meeting of the Society, and the ballot shall take place at the next meeting.
4. Not less than one full week before the meeting at which the ballot is to take place the Secretary shall send to every member of the Society the name and address of each Candidate, together with the names of his proposers.
5. Any member wishing to vote shall return to the Secretary, on or before the day of meeting, this notice, with the name of any Candidate to whom he objects crossed out.
6. One black ball in five shall exclude.
7. Each member of the Society shall pay an annual subscription of ten shillings and sixpence.
8. The subscription is payable in advance, and becomes due on the 1st of November of each year.
9. Any member whose subscription is not paid within twelve months after it has become due shall, if the Council see fit, be removed from the membership of the Society.
10. The Committee of Management shall fix the time and place of each meeting.
11. The Committee of Management shall determine the business of each meeting.
12. Each member shall have the privilege of introducing a visitor or visitors at any ordinary meeting of the Society. The names of visitors shall be entered into the attendance book, after which the visitors shall be permitted to join in the discussions of the Society.
13. The first meeting of the Society in the winter session shall be the Annual General Meeting.

14. One-fourth of the Members of the Council shall be replaced at each Annual Meeting by an equal number of members chosen from the Society at large.
15. The Council shall submit at each Annual Meeting a list of the members whom they recommend as officers during the ensuing year.
16. The Committee of Management shall arrange with the *Journal of Anatomy and Physiology* for the publication of the Proceedings of the Society, and of the papers read before the Society.
17. If at any time the Council shall be of opinion that the interests of the Society require the expulsion of a member, they shall submit the question to a special general meeting, at which, if two-thirds of the members of the Society vote for the expulsion of the member in question, his subscription for the current year shall be returned to him, and he shall thereupon cease to be a member of the Society. The voting at such special meetings shall be by ballot, and not less than twenty members shall form a quorum.
18. New Laws may be proposed by the Council at the Annual Meeting of the Society, or at a meeting specially summoned for the purpose, notice of the proposal being sent to each member of the Society with the summons to the meeting. At such meeting not less than twenty members form a quorum, and for the adoption of any rule a majority of two-thirds of the members present shall be required in its favour.
19. Any member may make suggestions to the Council regarding changes in the laws, by letter addressed to the Secretaries.

The Secretary then reported that the Council had elected the following gentlemen to the Committee of Management :—Alexander Macalister, F.R.S; John Curnow, M.D.; John Langton; G. D. Thane; J. Davies-Colley; G. B. Howes.

Professor Macalister then read a paper, entitled *A Note on some Common Errors in Descriptions of the Brachialis Anticus Muscle.*

The object of this communication was to show that the descriptions found in text-books of anatomy are wanting in accuracy, and a more precise method was advocated and exemplified in the case of the brachialus anticus.

A discussion followed, in which Professor Thane and Mr C. Stonham took part, the latter drawing attention to the peculiar striped appearance of the tendon of the muscle, and said it was of surgical importance in relation to ligature of the brachial artery.

Dr H. St. John Brooks read a paper on the *Short Muscles of the Pollex and Hallux of the Anthropoid Apes, with special reference to the Opponens Hallucis.*[1]

[1] This paper is printed *in extenso* in the *Journal of Anatomy and Physiology*, Oct. 1887, vol. xxii. p. 78.

After describing the muscles of the pollex and hallux in the hands and feet of the specimens he had dissected (Chimpanzee, Orang, and Gibbon), the author compared his results with those obtained by Vrolik, von Bischoff, Duvernoy, Huxley, and others. He found that in the hand the Gibbon departed further from man, with regard to this particular group of muscles, than either of the two others. He found that this anthropoid differed from man—(1) in the proximal position of the adductor pollicis; (2) in the part-insertion of the adductor into the metacarpal bone of the thumb; (3) in the prolongation of two of the short muscles (adductor and flexor brevis) to the ungual phalanx; and (4) in the greater relative development and more palmar position of the true ulnar head of the flexor brevis. With regard to the hallucial muscles, many authors had described an opponens hallucis in anthropoids, but the author had only found *an opponens hallucis derived from the tibial head of the flexor brevis, and therefore homologous to the opponens pollicis* in the Orang. He believed that the opponens described in the other anthropoids consisted of some fibres of the adductor inserted into the metatarsal bone of the hallux. He had found such fibres in the three genera that he had an opportunity of examining.

In the discussion which followed, Professors Humphry and Macalister took part.

Mr J. Bland Sutton then read a paper, entitled *A Critical Study in Cranial Morphology*.[1]

In this paper an argument is raised to show that the embryological history of the skull, and a comparative study of its appendicular elements, as well as the morphology of the trigeminal, facial, and vagal nerves, support the view that the dura mater represents the primitive cranium, and that the term *extra-cranial* applies, morphologically, to all structures outside the dura mater; hence the Gasserian ganglion, geniculate ganglion, petrosal nerves, meningeal and internal carotid arteries, and the structures in the cavernous sinus are truly extra-cranial. The entanglement of these and other structures is due to the progressive development of the cerebrum.

Mr Lockwood said he had often read Mr Sutton's paper on the temporal bone, and had followed it out upon fœtal skulls, and could confirm Mr Sutton's observations as regards the relation of the facial nerve and internal carotid artery. Although he had examined malar bones, he had never seen the three ossific centres which Mr Sutton mentioned, but only two. With regard to the lower jaw, whilst allowing that the investigation was exceedingly hard, he nevertheless could not find the various ossific centres mentioned by the author. However, he thought Mr Sutton's contentions were, on the whole, quite tenable.

Professor Thane agreed with Mr Lockwood's remarks as regards the malar bone and lower jaw, and wished to have the opportunity of

[1] This paper is printed *in extenso* in *Journal of Anatomy and Physiology*, Oct. 1887, vol. xxii. p. 28.

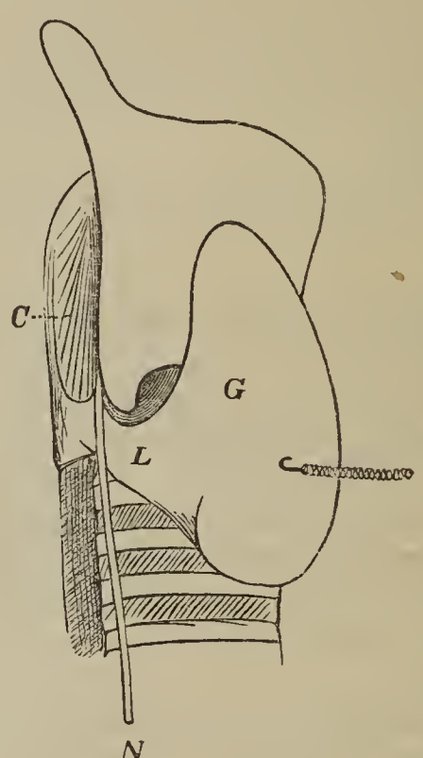
examining the various specimens from which the conclusions were drawn.

Professor Macalister criticised Mr Sutton's description of the ossification of the lower jaw, and said he had long been accustomed to teach the relations of the petrosal nerves which Mr Sutton had described.

In reply, Mr Sutton promised to bring the specimens which illustrated his paper to the next meeting of the Society.

Mr James Berry then read the following paper on the *Suspensory Ligaments of the Thyroid Gland*:—

The object of the brief communication which I have to make to the Society is to direct its attention to a pair of ligaments connected with the capsule of the thyroid gland, and which have hitherto, so far as I am aware, not received any notice.



G, Thyroid gland drawn forwards ; *L*, suspensory ligament ; *C*, crico-arytenoideus posticus muscle ; *N*, right recurrent laryngeal nerve.

They are strong bands which pass from the inner and back part of each lobe of the gland upwards to the sides of the cricoid cartilage.

To prevent confusion, I may explain at once that they have nothing at all to do with the pyramid, that process of glandular or fibrous tissue so often found extending from the front of the gland upwards to the hyoid bone.

Blending below with the capsule of the thyroid gland they form on each side the upper end of a kind of sling, in which the organ is suspended, and by which it is firmly fixed to the cricoid cartilage.

They form, therefore, suspensory ligaments for the gland, and are the main bonds of union between it and the larynx, serving to keep these structures in intimate contact.

When the thyroid gland has undergone great enlargement, as in the common goitre, these ligaments are of much importance, forming strong cords supporting the tumour, which would otherwise tend, by its weight, to slip away from the larynx.

My reason for drawing attention to these ligaments is, that I believe that they are of some importance in connection with operations for the removal of goitre.

In these cases, as I have just said, they form strong bands, which have to be divided before the tumour can be detached from the larynx.

I have noticed, in operations of this kind, which I have seen performed by others upon the living, and in a large number of excisions of the gland which I have myself performed on the dead body, that most of the difficulty in the separation of the tumour has occurred in the region of these ligaments.

This difficulty I believe to be a very frequent source of that accident which so commonly occurs in the removal of goitre,—I mean division of the recurrent laryngeal nerve.

This nerve lies in immediate contact with the ligament in its posterior and outer surface; it lies, therefore, superficial to it during the operation, when the tumour has been partially separated and turned over towards the middle line.

I think that if the position of this ligament were a little better known, the separation might be effected with much less dissection by simply cutting through it close to the gland; there would then be much less danger of wounding the nerve or of opening the trachea—an accident which is known to have occurred on several occasions.

I ought also to mention that this ligament, like most others, has no very definite and abrupt margins, but is continuous with the thin layers of fasciæ on either side of it, one of which, on the inner side and on the same level, is attached to the whole of the anterior surface of the cricoid cartilage, while the other below it passes to the posterior surface of the trachea.

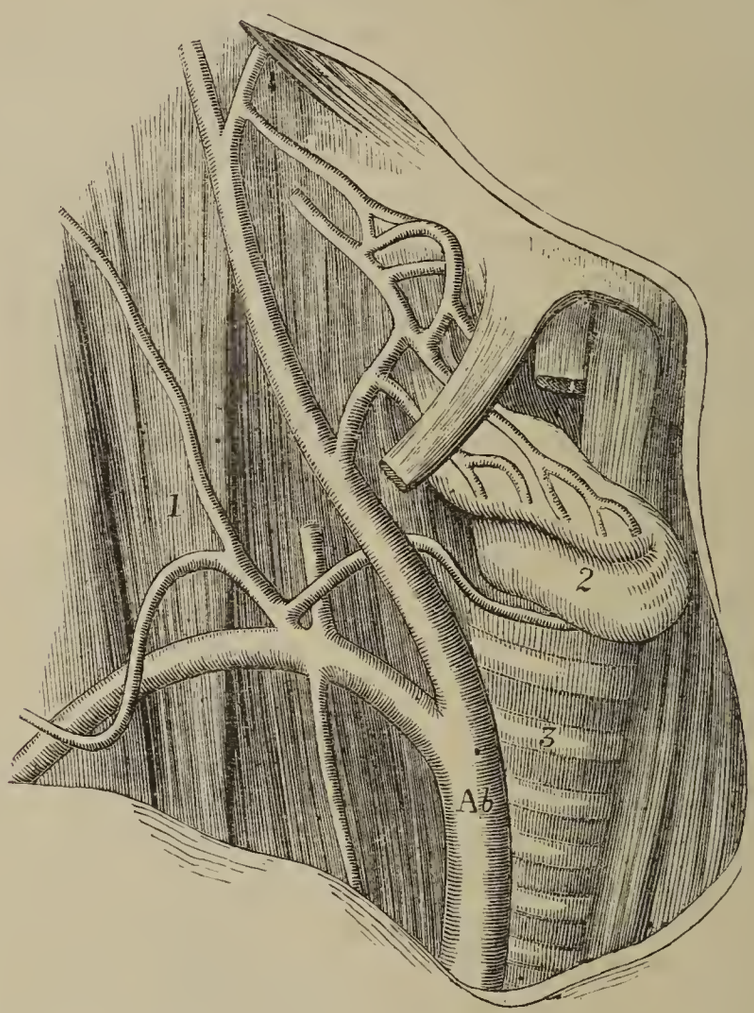
In the two specimens which I have brought for your inspection—one of which appears to be the seat of some goitrous enlargement—glass rods have been placed under these ligaments.

Professor Humphry said that Mr Berry's specimen showed that there were two strong ligaments.

Professor Curnow then drew attention to a specimen which he had brought, namely, the *Right Subclavian Artery passing in front of the Scalenus Anticus.*

This drawing is taken from a male subject, aged 28, dissected at King's College during the present summer session. The vein passed in front of the artery as usual. The artery is in its ordinary position on the first rib, but the scalenus anticus muscle and the tubercle for its insertion are placed much more posteriorly than normal. The cords of the brachial plexus are behind the scalenus anticus. The left subclavian artery and the left scalenus anticus were in their normal positions. Quain did not meet with this variation in 296 cases, but figured it from a preparation at St Bartholomew's Hospital.

Similar cases are reported by Manec, 1832; Lizars, 1834; Hird, 1837; Velpeau, 1839; Demeaux, 1841; Duval, 1853; Schwegel; Bochdalek, junior, 1867.



Ab., innominate artery; 1, scalenus anticus; 2, thyroid body; 3, trachea.

Its occurrence has been estimated as 1 in 150 cases, but it is certainly much less common than this.

Messrs Rickman Godlee and Charles Stonham showed an interesting series of anatomical specimens and casts of bronchi.

Dr J. Collins showed an abnormal Aortic Arch.

Mr Lockwood showed a method, suggested to him by Mr Houghton, the glass manufacturer, of mounting frozen sections in large flat photograph glasses.

The President announced that the next meeting would be held late in November, at University College, Gower Street.

PROCEEDINGS OF THE

ANATOMICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

An Ordinary Meeting of the Society was held on Tuesday, November 22, at University College, London, at 5 p.m.—Professor Humphry, F.R.S., President, in the chair. Present—Thirty-three members and visitors.

After the minutes of the last meeting had been read and confirmed, the following gentlemen were elected members of the Society :—John Malet Purser, J. Alfred Scott, Francis Heuston, Professor Redfern, E. H. Bennett, Professor Pye, James Chambers, F. Wardrop Griffith, Campbell Williams, Percy Flemming, Edgar H. Thane, Sinclair Long, and Ambrose Birmingham. The following were then announced for election at the next meeting :—Stanley Boyd, T. E. Little, J. Torrens, and Alfred Banks.

Dr Mott then read his paper on *The Minute Anatomy of Clarke's Column of the Spinal Cord of Man, the Monkey, and the Dog*, which will be printed *in extenso* in the April number of the *Journal of Anatomy and Physiology*, vol. xxii. (n.s. vol. ii.), and was illustrated by numerous histological specimens and micro-photos of specimens.

Dr Alex. Hill was surprised at the measurements of the cells of Clarke's column given by Dr Mott, and in speaking of their development, said they appeared after those of the anterior column.

Professor Charles Stewart asked what fibres proceeded from the cells which Dr Mott had drawn.

Dr Mott replied that his method was calculated to show the exact size of the cells, and that they all had fibres.

Professor Bertram Windle then read a paper on the *Arteries at the Base of the Brain*, which paper is printed *in extenso* in the *Journal of Anatomy and Physiology*, vol. xxii. (n.s. vol. ii.), p. 289.

Mr Black spoke of a case in which the internal carotid made a complete spiral before entering the skull.

Professor Alex. Macalister mentioned cases of divided basilar artery, and said the evidence went to show that all median arteries were formed by fusion.

A paper by Robert Howden, M.B, on *Variations in the Hippocampus Major and Eminentia Collateralis* was then read. This paper was illustrated by numerous casts of brains, and drawings, and is printed *in extenso* in the *Journal of Anatomy and Physiology*, vol. xxii. (n.s. vol. ii.), p. 283.

Mr Arthur Thomson wished to know whether the casts had been made before or after the brains had been hardened, and spoke of changes in shape which might ensue through the action of spirit.

Sir William Turner, in the absence of Mr Howden, said the moulds were obtained from hardened brains, and by means of plaster of Paris. From these moulds casts were taken with a composition of glycerine and gelatine, thickened with oxide of zinc and a small quantity of arsenious acid.

The following paper, by David Hepburn, M.B., was then read :—

A Needle in the Spinal Canal transfixing the Roots of Spinal Nerves.
David Hepburn, M.B., M.R.C.S. (Eng.), Senior Demonstrator of Anatomy, University of Edinburgh.

That the tissues of the living body are to a remarkable degree tolerant of pure metals is a fact, in confirmation of which numerous illustrations can be adduced. Thus it is well known that bullets which have lodged in different parts of the human body have lain dormant for long periods without causing special annoyance to, or making their presence felt by, their possessors. Furthermore, needles which have entered the body either remain stationary, or, aided by muscular action, travel long distances from their original point of entrance, or find their way to a free surface, and so perhaps come within the reach of removal.

The late Sir James Young Simpson based his method of deligation of arteries by means of acupressure on the tolerance above referred to. As the result of his study of this subject, he formulated a theory called the "Law of Tolerance of Living Structures for the presence of Foreign Metallic Bodies." In support of this law he makes the following statement :—

"Metallic bodies when lodged and embedded without much mechanical contusion or injury in living tissues produce comparatively little or no irritation by their presence ; and if inflammation is excited by their contact, that inflammation is usually limited to the first or adhesive stage, unless the contact at any point or points is so excessive as to produce ulceration by the mere effect of morbid pressure" (*Acupressure*, p. 457, 1864).

A curious specimen which serves still further to illustrate this tolerance, came under my notice in the Practical Anatomy Rooms of the University of Edinburgh. From the circumstances of the case it was not possible to obtain any clinical history. The subject was a female.

In the course of the dissection of the back, and as the laminæ

were being sawn through preparatory to opening the spinal canal, a piece of steel of the thickness of a sacking needle was discovered piercing the right ligamentum subflavum between the laminæ of the fourth and fifth lumbar vertebræ close to their articular processes. It did not project external to the laminæ, but, on opening the spinal canal, it was found to pierce first the trunk of a spinal nerve and then to pass through the opening in the dura mater which gave exit to this nerve.

The spinal cord and its membranes were next carefully removed from the spinal canal, and an incision made through the dura mater along its posterior aspect. This revealed the fact that the piece of metal was an inch in length, pointed and sharp at its inner end.

In its course through the *cauda equina* a number of nerve roots had been involved, some being impaled, while others were matted together by lymph of sufficient age to be firm and dense. Careful examination showed that altogether six anterior and two posterior nerve roots were so affected. These were the anterior roots of the 4th and 5th lumbar, and of the 1st, 2nd, 3rd, and 4th sacral nerves; the posterior root of the 1st lumbar (in part), and the 3rd lumbar nerve.

That part of the needle which passed amidst the nerve fibres was ensheathed in lymph, but the sharp end, half an inch in length, was free. The needle was blackened but not rusted.

The muscles of the limb supplied by the above nerves did not present any signs of atrophy when compared with those of the opposite limb.

In reply to Dr Mott, Sir William Turner said no degeneration had been observed in the spinal cord.

Professor Struthers gave an account of his methods of preparing and preserving the brain, museum specimens, and dissections.

1. (*a*) *The Brain.—First Stage*, the usual process by immersion in spirit, the membranes having been removed at once in water. This may take from ten to fourteen days according to the strength of the spirit, and the frequency with which it is changed. It should not be carried too far, so as to avoid too much hardening.—*Second Stage*, let the brain lie out for a day to allow the spirit to evaporate. Then place it in the following mixture of glycerine and carbolic acid,—clear glycerine 4 parts, clear carbolic acid 1 part. He had lately used the proportion of 8 of glycerine to 1 of carbolic acid. Two or three days in this fluid will suffice. Take the brain out and allow the glycerine to drip off until only a moist state remains. The brain may now be placed under a glass shade to keep off dust. When thus prepared the convolutions are tough, flexible, and elastic, so that they may be separated down to the bottom of the sulci. The lobes and particular convolutions may then be stained with various pigments applied with a brush. To show simply the lobes, his method is to stain the temporal and parietal lobes, leaving the frontal and occipital lobes uncoloured; and in separated hemispheres to stain

of a different colour also the circumcallosal gyrus. The above method enabled the brain to be handled freely, to lie out for demonstration simply under a glass shade, or to be mounted in jars, without fluid, for the museum shelves. He had many years ago applied this process to all his series of brains, human and comparative, prepared by the old spirit process, and found it a great facility and convenience. It may be applied to brains that have been any length of time in museums in spirit. He did not think Giacomini's method (see this *Journal*, vol. xiii., 1879, p. 282) so good, unless it is wished to have the brain of almost stony hardness, like a plaster cast, not admitting of the convolutions being opened out. That was the result of Giacomini's zinc stage. He showed two brains of the sheep and two human hemispheres, prepared carefully at the same time by the two processes, as an experiment for comparison. Those by Giacomini's process were not only too much hardened, but had shrunk very much in size.

(*b*) *Moist Method for Museum Specimens.*—Inject with spirit, to which some glycerine and carbolic acid have been added, if the part admits of injection; but injection is not necessary. Saturate with the glycerine and carbolic acid mixture. But undiluted glycerine will harden too much. The proportion is glycerine 2 to 1 of water, and to 8 parts of this fluid add 1 part of carbolic acid. When glycerine is used to soften, as during dissection, the proportion should be glycerine and water equal parts. It is not necessary to immerse the part in the fluid, it may be sponged on it or otherwise applied so as to saturate. Immersion may harden too much. Then allow to drip, till only the moist condition remains. Thus prepared, the viscus or dissection is mounted in a museum jar without any fluid, simply in the moist condition and no longer dropping. It may be variously suspended within the jar, as by being fixed to a plate of glass or to a surrounding galvanised iron wire. The glass top may be cemented, or may be applied loose, retained by Goodsir's bronze ring. The advantages of this method, over that by having the jar filled with spirit, are that there is no optical distortion, that it is more economical in the end, and, if the loose cover and bronze ring are employed, that it may be conveniently taken out at any time for closer examination or demonstration. Preparations of the bladder, prostate, uterus, heart, brain (prepared specially as above), the joints, &c., and dissections of the hand, foot, &c., may be conveniently mounted thus and placed on the museum shelves. The method may be employed equally for pathological specimens.

(*c*) *Moist Method for Dissections.*—Larger dissections, as of the ligaments, muscles, blood-vessels, nerves, viscera, &c., are prepared in the above method (*b*), and are useful in teaching in addition to the recent dissections. They do not dry like spirit preparations, and may lie out in the dissecting-room or museum simply under a glass shade to keep off dust. This method may mostly supersede the spirit-basins at present fashionable in some dissecting-rooms, and by changing them from time to time, according to the stage of the

anatomical course, a great many more views may be exposed than by the basin method. Other antiseptics may be used instead of the carbolic acid, but the latter seemed to him as yet to prove the best. He was not sure, however, but that the brown colour of the dissections, after exposure to light, was greater with carbolic acid. Spirit preparations and glycerine preparations should not be placed in the same receptacle, or the spirit preparation will become mummified. To change all the dissections of the school from spirit to glycerine is attended by considerable expense, but it is economical in the end. He had managed during two autumns to overtake the whole, after being satisfied of the advantages. It would not be easy to express the improvement these changes had enabled him to effect in conducting the anatomical school. He had had the pleasure of showing the processes to various anatomical friends, and he had given this account of them to this Society in the hope that they may be tried and found useful in other anatomical schools.

Dr Struthers also showed specimens of the following :—

2. (*a*) *Rider's bone.* Reference was made to two cases of this rare condition, viz., Mr Birkett's case (*Guy's Hosp. Reports*, 1868) and Mr Bryant's case (*Practice of Surgery*, vol. ii., 1876), in both of which the condition appeared to have had its origin in some rupture in the region of the adductor muscles during violent action on horseback. For this preparation he was indebted to his former pupil, Dr James Allan of Leeds. The dissection and notes are by Dr Allan, who had kindly consented to his bringing the preparation and case before the Society on account of the rarity of the condition. It was from a man aged 55. The bone of each side is about $1\frac{1}{2}$ inch in length, $\frac{3}{4}$ to 1 inch thick, and mostly triangular. Right bone articulated to a projecting platform at the angle of the pubes, by a diarthrodial joint with very irregular surface. This bone was felt to be movable from side to side during life. Left bone immovably attached to the pubes. The muscular attachments are still seen on the left side. Adductor longus tendon directly prolonged from the end of the bone, which is flattened towards the tendon; attached to inner surface, on to the point, the fascia lata; to inner posterior border, fore part of gracilis; to outer side, inner part of pectineus; behind, a large part of adductor brevis. All these muscular attachments are of full size. But, curiously, in regard to the origin of the ossification in this case, the man would seem not to have been a rider. Dr Allan mentions that "he had been a foot soldier for twenty-one years, but I have no note of his having been much on horseback in any capacity."

(*b*) Series of specimens of permanently separate Acromion Process, simulating fracture.

(*c*) Series of preparations of the variety in which the right Subclavian Artery arises last from the arch of the aorta.

An account of these specimens will be published separately.

Professor Thane exhibited the thoracic viscera in a case of *Situs Inversus*. The subject was a male, and the transposition affected all the organs of the thorax and abdomen. As in the cases recorded by M. Weber, H. Lebonoff, and C. Aeby, there was an eparterial bronchus on the left side, but not on the right. The lungs were, however, remarkably symmetrical in their external conformation. The left lung was divided into three lobes, which were supplied by the primary branches of the bronchus in a manner precisely agreeing with the normal arrangement on the right side. The cardiac bronchus of Aeby descended from the left bronchial stem to the inner part of the lower lobe. The right lung was also divided into three lobes, in appearance like those of the left lung; but both the upper lobe and the small middle lobe were supplied by the first ventral hyparterial branch of the right bronchus. The aorta arched over the root of the right lung, and gave off its large branches in the following order, viz., left innominate, right common carotid, and right subclavian. The superior vena cava descended on the left side. and the large azygos vein passed forwards to it above the root of the left lung.

Mr Arthur Thomson also showed a plan of mounting frozen sections, and Professor MacAlister exhibited various skulls.

It was announced that the next meeting would be held at King's College in February.

PROCEEDINGS OF THE

ANATOMICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

An Ordinary Meeting of the Anatomical Society of Great Britain and Ireland was held on Wednesday, February 8, at King's College—Professor Humphry, F.R.S., President, in the chair. Present—Thirty members and visitors.

Mr Mayo Collier read his paper on *The Functions of the Sinuses of Valsalva and Auricular Appendices, with some Remarks on the Mechanism of the Heart and Pulse.*

(Abstract.)

The object of the paper is to disprove the present apparently accepted idea, that the sinuses of Valsalva are mere bulgings of the arterial walls, formed by a reflex current induced by the sudden closure of the semilunar valves.

The existence of a reflex current is shown to be impossible, and the theory of the sudden opening and closure of the semilunar valves is strongly opposed.

The presence of the sinuses of Valsalva is urged as an absolute essential to the mechanism of the heart's action. The paper then treats of the action of the auricle and the part played by the auricular appendix, the latter being considered as the only part of the auricle that sensibly and vigorously contracts.

The causes of the first sound of the heart are next alluded to, and the theory that the closure and vibration of the tricuspid and mitral valves assist in its production is refuted. The action of the ventricle and the mode of the injection of its contents into the aorta is dwelt upon at some length.

The latter part of the paper is devoted to the mechanism of the pulse, and an explanation is given of the so-called dicrotism.

The paper terminates with a summary of the chief points of the conclusions arrived at.

Ossification of Skull.—Mr J. Bland Sutton showed specimens of the ossification of the superior maxilla, inferior maxilla, and malar bones to illustrate his paper on the morphology of the skull (*Proc.*, p. 3, Oct. 1887).

Mr Sutton claimed that the superior maxilla and inferior maxilla showed the centres he had mentioned in his paper, but the malar bone was not entirely satisfactory.

There was no discussion.

Cranio-Cerebral Topography.—Professor Cunningham, of Trinity College, Dublin, showed a series of models illustrative of the relations of the different parts of the brain to the surface of the head at dif-

ferent periods of life. He stated that the results of his investigation would shortly be published in the *Transactions of the Royal Irish Academy*, but that in the meantime he desired to explain the methods he had adopted in the preparation of the models. As the work progressed he had been able to improve greatly upon the methods he had at first employed, so that latterly he had been able to harden the brain *in situ*, and obtain a cast which gave absolutely accurate results in every detail.

The methods were the following :—(1) A careful cast was taken of the entire head immediately after the subject came into the anatomical department. This was laid aside, and means were then taken to harden the brain. (2) Injection pipes were placed in the internal carotid arteries, and twice daily the head was injected with the following fluid :—1 part spirit (60 over proof); 2 parts Müller's fluid. To each injection 4 drachms of glycerine were added. This treatment was continued for a fortnight. (3) When the injections had been fairly started the scalp was removed from the right side of the head, and the whole preparation immersed in 15 per cent. solution of hydrochloric acid. The action of the acid was carefully watched until the outer table and *no more* of the cranial wall was softened. (4) The head was then taken out of the acid solution and washed in water and fixed in a vice. The whole of the cranial wall on the right side, with the exception of narrow bars corresponding to the sutural lines, was next removed. The utmost care was taken to preserve the dura mater intact, because it was found that so long as this was entire the injections could be continued, and the brain kept from shrinking. (5) When it was considered that the brain was sufficiently hard, a 10 per cent. solution of hydrate of chloral was substituted for the Müller and spirit injection, and after three applications of this the membranes were removed and the cast taken. (6) Immediately before the removal of the membranes the specimen received the last injection. By doing this it was found that the brain would retain its full size, and not undergo the least shrinkage for at least twenty-four hours. Each cast required a mould of from thirteen to fifteen pieces, and these could generally be made in about five hours. (7) When the cast was drawn from the mould an attempt was made to depict the brain on the outside of the corresponding cast of the untouched head. Great difficulty was here experienced, because the surface upon which it had to be drawn was of course considerably wider in its area than the surface of the brain. The suture lines and the brain fissures were, however, accurately adjusted, and the defects in the representation therefore are to be found chiefly in the greater breadth of the convolutions and size of the lobes generally.

The series of models exhibited comprised the following :—

1. Head of a boy of five years old.
2. Head of a girl of 11 years old.
3. Head of a boy of 12 years old.
4. Head of a youth of 15.
5. Head of an adult female.
6. Head of an adult male.

Two casts of the entire head with the brain depicted on the outside (corresponding to Nos. 2 and 3) were also shown.

Professor Cunningham then read a paper on the *Musculus sternalis*,

which paper is printed *in extenso* in the *Journal of Anatomy and Physiology*, vol. xxii. (N.S. vol. ii.), p. 391.

In this paper is detailed the nerve-relationships of seventeen cases of the musculus sternalis. From these the following conclusions are drawn :—

1. That the sternalis muscle is a portion of the pectoralis major.
2. That it is produced by a rotatory dislocation of certain of the fibres of the great pectoral.
3. That different fibres are used for this purpose in different cases.
4. That the deviation of the fibres of the great pectoral restore in this portion of it the primitive direction and primitive connections of the pectoral muscle.
5. That the anomaly may possibly be regarded as showing a tendency to the formation of a new muscle in man devoted to costal inspiration.

Professor Humphry considered the existence of the sternalis due to incomplete segmentation of the great muscular sheet

Professor Macalister discussed the question of the origin of the sternalis, and thought too much stress had been laid upon the last point. The muscle was present in 3 cases out of 115, but this was a low average. He confirmed Professor Cunningham's observations that the muscle was absent in other mammals.

Professor Thane was inclined to agree with the author of the paper. He discussed the question whether the muscle was vestigial or developing, and, in the latter case, as Professor Cunningham had remarked, devoted to costal respiration.

Mr Sutton also made some remarks.

Professor Cunningham then communicated for the author the following paper on the *Morphology of the Muscles on the Extensor Aspect of the Middle and Distal Segments of the Limbs*, by H. St John Brooks, M.D.

In this paper the muscles on the extensor aspect of the fore-arm and hand, and the corresponding group of muscles in the leg and foot are referred to a type schema which is constructed as follows :— The mass of muscle on the extensor aspect of the upper segment of the limb is inserted in part into the bones of the middle segment (forming the triceps or quadriceps), and in part prolonged below the elbow or knee. Here it divides longitudinally into three sectors—a radial or tibial, an ulnar or fibular, and an intermediate. The two marginal sectors are each in part inserted into the bones of the middle segment (anconeus and supinator brevis in man). The intermediate sector divides into three slips, which are inserted into the three middle metacarpal (or metatarsal) bones. The radial sector is inserted into the first metacarpal bone, the ulnar sector into the fifth. Thus each of the five metatarsal (or metacarpal) bones has its own long extensor, and from each tendon of insertion a fascial slip is sent forward to join the tendons of the short extensor. The short or deep extensor is composed of five muscular slips which end in as many tendons ; these tendons are inserted into the phalanges of the five

digits. This extensor brevis radiates from the centre of the carpus (or tarsus) and each slip is reinforced by a pair of accessory heads which arise from the corresponding metacarpal (or metatarsal) bone. These accessory heads are not dorsal interossei ; they are supplied by the posterior interosseous (or anterior tibial) nerve, and are represented by well-developed muscles in reptiles, and by the occasional extensor brevis digitorum manus, and by the deep slips of extensor brevis digitorum pedis (described by Ruge) in man.

Hatteria may be selected as an animal which departs but little from the above type, and at the same time such deviations as occur are probably among the first to take place in vertebrate animals above Pisces and foreshadow the more profound modifications which have come to pass in the higher Mammalia. The most important deviations from the type in this lizard are—(1) the segmentation of the muscles on the extensor aspect of the fore-arm and leg from the muscles of the arm and thigh ; (2) the attachment of the extensors of the carpus and metacarpus to the radial condyle of the humerus, and the origin of the corresponding muscles in the hind limb from the tibia and fibula (with the exception of the intermediate sector, which is attached to the *fibular* condyle of the femur) ; (3) the partial segmentation of the ulnar sector into anconeus and extensor carpi ulnaris, and of the radial sector into extensor carpi radialis and supinator longus brevis ; also the absence of any insertion of the tibial and fibular sectors into the tibia and fibula (such an insertion, however, exists in the *Cryptobranchus*, as Professor Humphry has shown (*Jour. of Anat. and Phys.*, vol. vi. p. 41) ; (4) the development from the extensor brevis digitorum of an extensor ossis metacarpi pollicis (or metatarsi hallucis), which, in company with the more radially (tibially) placed bellies of the extensor brevis digitorum, has wandered from the dorsum of the hand (foot) to a more proximal point on the fore-arm (or leg).

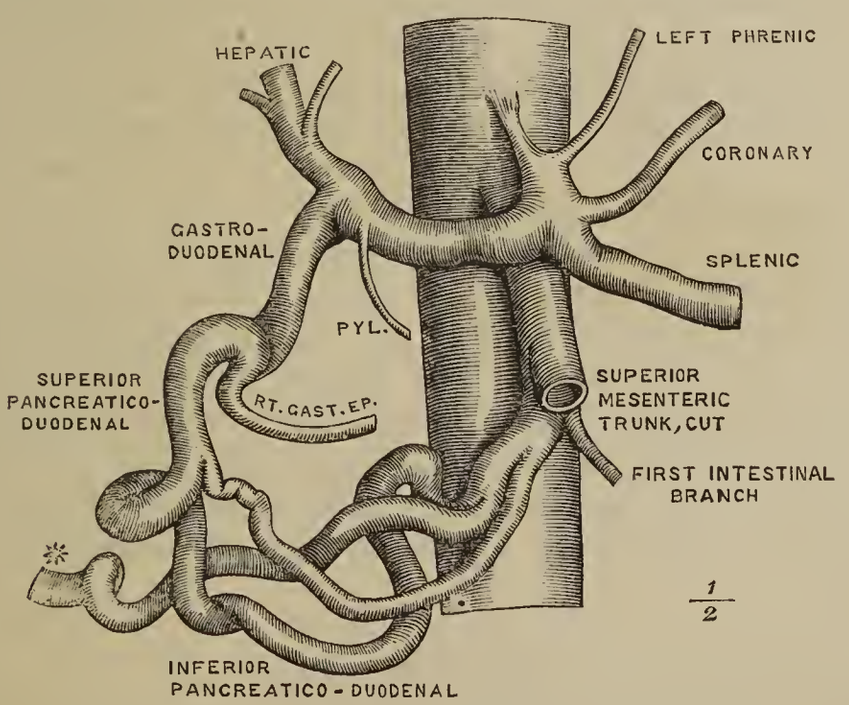
A great deal of the above work has already been done by Professor Humphry, but a general restatement of the morphology of these groups of muscles appears desirable. The following points do not appear to have been distinctly indicated in any previous paper :—(1) That the extensor minimi digiti of human anatomy was originally the fifth belly of a deep (short) extensor ; (2) that the anconeus belongs more properly to the extensor carpi ulnaris than to the triceps ; (3) that the occasional extensor brevis digitorum manus in man is not homologous to the extensor brevis digitorum (pedis), but to the occasional deeper slips of the latter muscle (as described by Ruge) and to the metacarpal (metatarsal) heads of the short extensor in reptiles (so often confounded with interossei dorsales) ; (4) that the condition of the extensor brevis digitorum in Man is a reversion to type, from which type the same muscle has wandered in Ornithorhynchus and marsupials (the latter condition is considered to be the primitive by Ruge) ; (5) that the "nerve to the anconeus" of human anatomy is homologous to the branch of the anterior crural described by Ruge in Ornithorhynchus (*Morph. Jahrbuch*, Bd. iv., 1878, p. 597), which is distributed to the tibialis anticus and extensor hallucis longus, being *a nerve from the trunk which supplies*

the extensor of the middle segment prolonged to the extensors situated below the knee (or elbow) joints.

Vestigial Muscles.—Mr J. Bland Sutton then read a paper, part of which, he said, was directly opposed to the views advanced by Dr St. John Brooks. In this paper an endeavour is made to show that Man, in common with the Quadrumana, originally possessed a complete deep, as well as a superficial, set of extensors for the fingers. This deep set primitively arose from the extensor condyle of the humerus, and adjacent parts of the olecranon. Gradually they migrated down the ulna. The secundus descended first, then the indicis; the medius and annularis gradually followed, but the extensor minimus retained its old connection with the condyle. As the muscles descended, they carried with them a branch of the musculo-spiral nerve—the posterior interosseous. By degrees the medius and annularis regressed into fibrous tissue, and the nerve became embedded in their remains on the back of the carpus.

An attempt was also made to show that Gimbernat's ligament and the triangular fascia are persistent remains of the ligament which binds the epipubes to the ilio-pectineal line in the marsupials. Finally, reasons were advanced for regarding the ilio-femoral band of the human hip-joint as the fibrous representative of the gluteus quartus, a muscle extremely common in all classes of mammals and often functionally present in Man.

Obliteration of Cœliac Axis.—Professor Thane exhibited a specimen in which the cœliac axis was obliterated, and the collateral circulation established through the pancreatico-duodenal arteries. The arrangement of the vessels is shown in the accompanying figure, in which



the renal and spermatic arteries are omitted for the sake of clearness. The cœliac axis was represented at its origin from the aorta by an impervious fibrous cord, 2·5 mm. thick and 11 mm. long. This was succeeded by a sinus-like dilatation, from which the left phrenic, the

coronary, the splenic, and the hepatic arteries were given off. The hepatic artery was of large size, having a diameter of 9 mm.; the calibre of the others was normal. The hepatic artery, having given off the small pyloric branch, divided into an ascending portion to the liver (6 mm.), and a larger descending part, the gastro-duodenal artery (8 mm.). The latter was continued, after supplying the right gastro-epiploic artery, into the greatly enlarged superior pancreatico-duodenal (7 mm.).

The superior mesenteric artery was larger than usual (9 mm.), and divided after a short course into two parts of nearly equal size (7–8 mm.). The anterior of these was the normal trunk and furnished the usual branches. The posterior gave off the first intestinal branch to the beginning of the jejunum, and then turning to the right took the course of the inferior pancreatico-duodenal artery between the pancreas and duodenum. The superior and inferior pancreatico-duodenal arteries formed two large loops in the concavity of the duodenum, the vessels composing which had a diameter of 6 mm. and 4 mm. respectively, and were very tortuous with spiral windings. From the inferior pancreatico-duodenal artery a third large branch (marked *), 6 mm. in diameter, proceeded to the back of the second portion of the duodenum; but it could not be followed farther owing to the vessel having burst during the injection of the body. The branches of the cœliac axis were fed entirely through the loops formed by the pancreatico-duodenal arteries.

There was no appearance of disease in any of the vessels concerned, and no reason was suggested for the occlusion of the cœliac trunk.

Professor Curnow showed the following specimens:—

(1) An inter-parietal bone. (2) A constricted aorta, with enlarged anastomotic branches. The constriction, which amounted almost to obliteration, occurred at the junction of the arch with the trunk of the thoracic aorta immediately below the attachment of the ductus arteriosus. The internal mammary arteries were much enlarged as well as the superior intercostals, which were seen to be freely inosculating with the enlarged first aortic intercostals on both sides. The other aortic intercostals were evidently larger than normal. (3) A double aortic arch enclosing trachea and œsophagus (*Trans. Path. Soc. Lond.*, vol. xxvi. p. 33). The trachea and gullet (which is in its ordinary position behind and to the left) are encircled by a pervious vascular ring formed in front by a left brachio-cephalic trunk, the first part of the left subclavian, and the communicating vessel between it and the descending aorta, and behind by a posterior aortic arch, from which the right carotid and subclavian arteries take origin.

Specimens.—The following specimen was also shown:—

Mr Kenny: Abnormal relation of phrenic nerve to the subclavian vessels.

It was then announced that the next meeting would be held at St Bartholomew's Hospital, on April 18, at 4.45 p.m.

PROCEEDINGS OF THE

ANATOMICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

An Ordinary Meeting of the Society was held in the Library of St Bartholomew's Hospital, on Wednesday, April 18, 1888—President G. M. Humphry, F.R.S., in the Chair. Present—Thirty-two members and visitors. The minutes of the previous meeting were confirmed. The following gentlemen were declared to have been elected members of the Society :—H. Duncan, Humphry Broomfield, Bernard Lawson, Gordon C. Brodie, John S. Morgan, Dr Thompson, A. W. Cadman, James W. Groves.

Mr J. Bland Sutton then discussed the *Morphology of the Deep Extensors of the Fore-Arm*, in connection with Mr St John Brooks's paper read at the previous meeting (*Proceedings*, p. xv), and said,—Mr Brooks bases his arguments on facts derived from amphibian and reptilian myology supplemented by the Edentates. I learnt long ago that one could prove almost any view concerning particular muscles by dissecting lizards and amphibians. These forms are invaluable when we have to deal with general questions of myology, but are useless for illustrating particular cases. Mammalian myological questions must, so far as particular groups of muscles are concerned, be studied in mammals. To choose Edentates is very risky, for though they are undoubtedly very archaic, nevertheless the forms are very aberrant, and even those most enthusiastic in admiring this group are bound to admit that it is for the most part a heterogenous collection.

Dr St John Brooks replied that Mr Sutton had not taken exception to his paper as a whole, but only to one particular point. This point, however, was a vital one. According to Mr Sutton the deep extensor muscles arose originally from the humerus and migrated *downwards*. In the speaker's opinion they were originally situated on the dorsum of the hand, from whence they migrated *upwards*. Dr Brooks believed that the President had formed a similar theory to the one he was advocating, and read an extract from the *Journal of Anat. and Phys.*, vol. vi., in support of this. He considered, in fact, that he had re-stated Professor Humphry's views, and added some additional evidence. In some points, however, his opinions were at variance with Professor Humphry's; for instance, he believed the extensor minimi digiti to be morphologically part of the deep layer, while Professor Humphry regarded it as a part of the superficial layer. He was glad to see that Mr Sutton

agreed with him in placing it with the deep group. Professor Ruge had advanced a very similar theory, in regard to the deep extensors of the toes, to Mr Sutton's theory of the descent of the deep extensors of the fingers. Ruge believes that the extensor brevis digitorum (pedis) was originally a peroneal muscle which gradually made its way downwards to the dorsum of the foot. He would deal with Sutton's and Ruge's theories together. If we confined our attention to mammalian myology there was much to be said in favour of these theories, particularly in the case of the foot (Ruge's theory). But an examination of reptilian and amphibian myology showed these theories, in the speaker's opinion, to be quite untenable: in all these animals there was an extensor brevis digitorum both in the hand and the foot, which could be seen in the lizards, gradually extending its origin upwards to the fore-arm and to the leg. Dr Brooks then showed a number of drawings and diagrams illustrating these points, and invited the meeting to compare these drawings with the dissected specimens which he had brought to the meeting. Dr Brooks then said that although the Ornithodelphs and Marsupials departed widely from the Reptiles in the case of these particular groups of muscles, the Edentates (an archaic order of Mammals), on the contrary, showed remarkable reptilian characters, and he pointed out the strong resemblance between a figure of the foot and leg of the Great Ant-Eater (Macalister, in *Trans. Roy. Irish Acad.*, vol. xxv., plate xxvi. fig. 5) and one of his own drawings of the corresponding part in Hatteria. In one point he considered Mr Sutton's views to be particularly erroneous, when he said that "as the muscles descended they carried with them a branch of the musculo-spiral nerve, the posterior interosseous." The speaker had found the posterior interosseous nerve supplying both the muscles and integument on the dorsum of the hand in Reptiles and Amphibia, as could be seen in the diagram of Hatteria which he had already shown. How then could the nerve have been "carried down" in the higher mammals when it was not only already *down* but relatively *much larger* in primitive forms?

Professor Thane was of opinion that the disposition of the muscles in Reptilia and Amphibia was important, as throwing light on the origin of the corresponding parts in the Mammalia, and that the tendency of the more prevalent variations in man was to support Dr Brooks's view that the deep extensors were primitively short muscles.

Mr Lockwood asked whether he had correctly understood Mr Sutton to say that the posterior interosseous ganglion was the remains of the deep extensors of the human subject. He thought the fact that, in some types, the posterior interosseous nerve supplied digital cutaneous branches, although the deep extensors had, at the same time, a high attachment, disposed of Mr Sutton's theory.

Professor G. B. Howes inclined towards an acceptation of Mr Brooks's views; and attached considerable importance to the evidence adduced by him from the Edentata, in consideration of the accepted views of the structural lowliness of that group. He also pointed out

the advisibility of examining the parts in the *Dasyuridæ*, and especially in the Banded Ant-Eater (*Myrmecobius*), that animal being, in its dental characters, identical with the oldest known Mesozoic mammals.

The following papers were then read :—

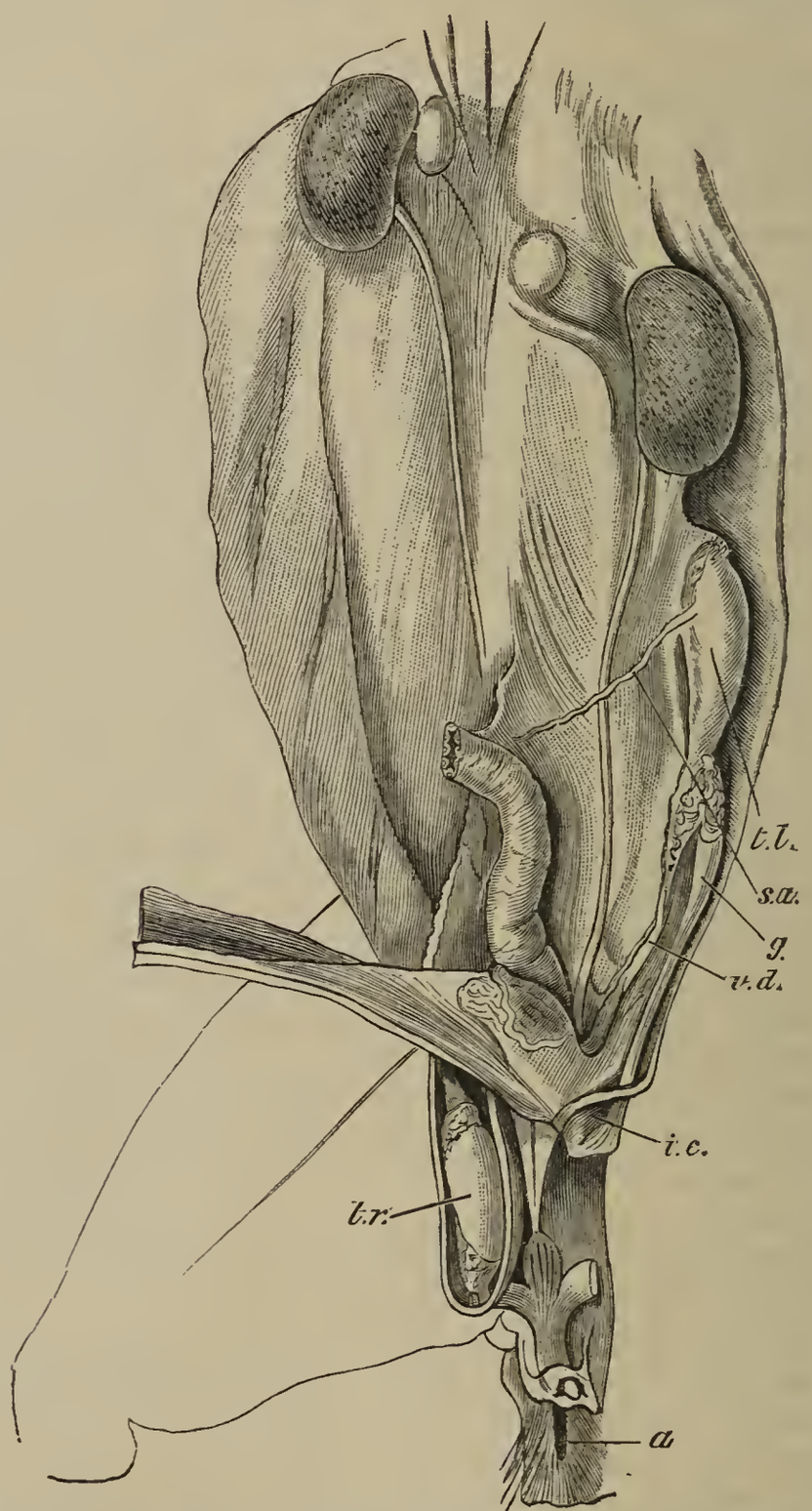
Rabbit with an Undescended Testis, with Notes on the Descent of the Testis in the same Animal. By M. F. Woodward, Demonstrator of Zoology, Normal School of Science and Royal School of Mines.

Among a number of adult rabbits recently obtained for dissection in the Biological Laboratory at the Normal School of Science, my attention was called to the one forming the subject of these notes; it is exceptional in being, so far as I am able to discover, the first adult rabbit in which the existence of an undescended testis has been recorded. The testis and scrotal sac of the right side were well developed; the left testis was small, and occupied a position normal to the ovary. On careful examination the specimen proved to be a male of from five to six months, and consequently sexually adult, for the rabbit is capable of breeding at the age of four months. The external genital organs were rather small, and the right scrotal sac was alone visible. The testis of the right side (*t.r.*) was fully formed, and had descended completely to the bottom of the afore-named sac, as usually happens only when the animal is in breeding condition. It was somewhat curved, and measured 33 mm. in length, including the epididymis, and 10 mm. in breadth; the vas deferens, uterus masculinus, prostate, and Cowper's glands were all in the normal condition, but small. Of the left scrotal sac there was no sign; the left testis (*t.l.*), which was very long and narrow, measured with the epididymis 36 mm. in length and 6 mm. in width; it was situated in the body-cavity, immediately behind the kidney, and to this it was attached by a fold of mesentery, the *plica vascularis*. It was suspended to the dorsal body-wall by the mesorchium, and hung down freely, closely resembling the ovary in position and size.

The spermatic artery (*s.a.*) and vein, instead of running back as they did on the other side, ran directly outwards and slightly forwards, and in fact retained their primitive position, showing the genital gland itself to have remained undisturbed. The epididymis was small in calibre, but relatively long, as the tubes composing it were loosely coiled; its cauda, which was much the longest segment, gave origin to the vas deferens (*v.d.*), and this, passing directly back to the uterus masculinus, crossed the ureter near the bladder. A little above that point, it received a branch from the inferior vesicular artery, which could be traced anteriorly as far as the cauda itself.

Skirting the free ventral border of the mesentery suspending the left vas deferens there was a flat band of muscular connective-tissue

(*g.*) attached anteriorly to the cauda epididymis; posteriorly it passed through the inguinal canal (*i.c.*) (which was rudimentary, and measured 12 mm. across), and then spread out in the region of the symphysis pubis. This band is the *gubernaculum testis*, and it



Urinogenital organs of a male rabbit, with an undescended testis on the left side, half its natural size.

measured 45 mm. in length. The processus vaginalis was very slightly developed, and in no way in excess of that seen in some females.

A microscopic examination of the undescended testis showed that the seminal tubules were lined by a well-developed germinal

epithelium, and in most cases a second irregular layer could be recognised, evidently budded off from the first, but destitute of the characters of the proliferating layer of the adult tubule. There were no traces of either the "nutritive" layer or of developing spermatozoa. The testis showed, however, no signs of actual degeneration, and I assume that it might have become functional had the animal grown older.

The testes in the rabbit begin to descend during the last week of intrauterine life, and at birth they come to lie just at the entrance of the inguinal canal. They pass into this about the second week after birth; but it is not till the animal is about a month old that they descend into the scrotal sacs, and even then they are so small that their presence is not perceptible externally. This becomes clearly obvious at the end of the second month, and by the time the animal is four months old it is sexually mature, though by no means full grown.

Hunter was the first to describe in detail (*Animal Economy*) the descent of the testis in the human subject, and he also noted the relations of the gubernaculum and processus vaginalis. The descent of the testes in the rabbit does not seem to have been hitherto described. It appears to take place in practically the same manner as in the human subject; it is, however, more difficult to distinguish between the sexes in the early stages, on account of the great development in the female of the round ligament and processus vaginalis.

It is worthy of note here that in some mammals the testes are retained permanently within the body-cavity, never descending into the scrotal sacs at all. Those mammals possessed of this peculiarity are termed by Owen and Milne Edwards the "*Testiconda*"; they embrace the Proboscidea, Cetacea, Sirenia, Edentata, and Monotremata; and the genital glands occupy somewhat different positions in the different members of the series. In the Insectivora, on the other hand, the testes descend into the inguinal canal, but no scrotal sacs are formed. In the rabbit they descend to the bottom of the scrotal sacs during the rut, lying at other times in the neck of the inguinal canal. From this, however, they are never fully retracted.

It is interesting to comment, in the light of the foregoing, upon the existence in an adult mammal of conditions so diverse as are those of opposite sides of the one under consideration. Whether, however, the undescended testis ever becomes functional, it is doubtful; precedent would seem to indicate that it does not.

References.—Milne Edwards, *Physiol. et l'Anat. Comp.*, tom. 9, p. 3. J. Hunter, "Descent of the Testicle," in *Animal Economy*, Lond., 1786. Kölliker, *Entwicklungsgs.*, 1861, p. 453. Lockwood, C. B., *Development and Transition of the Testis*, *Jour. Anat. and Phys.* vol. xxi. p. 635, vol. xxii. pp. 38, 481.

Undescended Right Testicle, Hypertrophy of the Left One in a Monkey.
By Walter K. Sibley, B.A., M.B., B.C. Camb.

The specimen is taken from a Bonnet Monkey (*Macacus sinicus*) which had lived in the Zoological Society's Gardens some four years, and died from visceral tuberculosis. The bones were soft and deformed. The scrotum was distended, and contained only one (the left) testicle, which was considerably and uniformly enlarged. This together with the epididymis weighed some 17 grammes. It was rather soft, but upon section revealed normal tubular tissue. There was no fluid in the tunica vaginalis nor adhesion of its layers; the cord was normal; there was no hernia or other abnormality about the scrotal

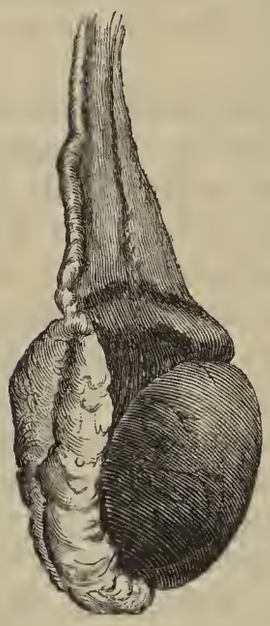


Fig. 1.

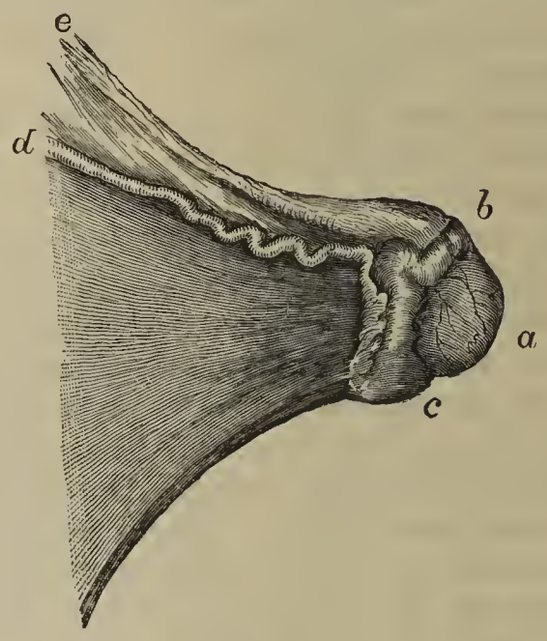


Fig. 2.

Fig. 1.—Undescended Testicle in a Monkey (reduced in size), left testicle showing considerable hypertrophy of its body.

Fig. 2.—Right Testicle with Broad Mesorchium (reduced in size). *a*, body of testis; *b*, globus major; *c*, globus minor; *d*, vas deferens; *e*, blood-vessels and remains of embryonic structures; *f*, gubernaculum.

contents. This hypertrophied testicle was twice the size of a normal one in this form of monkey (fig. 2). The right testicle was lying in the abdominal cavity below the kidney of this side, attached to the posterior abdominal wall by a broad mesorchium containing in its folds the blood-vessels and embryonic remnants together with the vas deferens and gubernaculum (fig. 1). This testicle, together with its adjacent appendages, weighed under 5 grammes, thus not a third the weight of its fellow. In consistence it was firm upon section, showed normal tubular substance. The epididymis was large in proportion to the testicle, not being arrested to the same degree in its development.

Histologically, both testicles consisted of typical glandular tissues. All parts of the body, especially the muscles, undergo a process of

hypertrophy when subjected to increased and intermittent metabolism. But this change is not so generally attained by the nervous and glandular organs. The viscus most usually given as an example of physiological hypertrophy is the kidney. If one kidney be absent, or from any cause be prevented from performing its part in the animal's economy, the other kidney generally taking on increased function becomes enlarged, that is hypertrophied, not only as to its elementary cells, but also in the actual numbers of the glomeruli and tubules.

But this process is not usually described as taking place in the testicle.

Few writers on the subject speak of an hypertrophy of the testicle following the removal or arrested development of its fellow, in fact many doubt it ever occurring.

Curling,[1] however, relates a case in a Monorchis (where no trace of a second testicle could be found upon dissection) of a marked hypertrophy of the existing one; he also quotes three examples of an enlargement of a single testicle in cases where the other one was undescended, and offers as an explanation of the usual non-occurrence of compensatory hypertrophy, "that it is due to the bounty of nature in all that concerns reproduction, one testicle being sufficient for manhood"; he adds, "it is not surprising, therefore, that in cases of absence or imperfect development of one testicle the other does not as a rule exceed the normal size."

Sutton,[2] in his *General Pathology*, refers to the rare specimen in the museum of the College of Surgeons of an hypertrophied testicle of a Monorchis which weighed considerably over 2 ounces.

Cohnheim[3] speaks of hypertrophy of the testicle following increased blood-supply, but does not give any references.

There is no obvious reason why the testicle should not hypertrophy as well as any other glandular organ; it does not in any way differ embryologically or physiologically from other tissues under normal conditions, why then should it under slightly altered ones go off along a path of its own?

Organs called into more active use enlarge, but it is generally stated that under the same circumstances the testicle becomes smaller. And so, conversely, that text-books usually pass over hypertrophy as if the writers did not believe it ever occurred.

In the case of birds and many lower animals the testicles undergo very marked periodic hypertrophy during the breeding season.

In birds at this time the testicles usually occupy a very considerable and conspicuous part of the abdominal cavity, and at other times are insignificant.

It seems probable that this subject in human pathology has been overlooked, and a statement once having been made it has been repeated, but without any fresh evidence.

[1] Curling, *Diseases of the Testicle*, 1866, p. 59.
[2] Bland Sutton, *General Pathology*, 1886, p. 13.
[3] Cohnheim, *Allgemeine Pathologie*, p. 697.

It is in order that cases of this nature may be noted that I have thought it worth while bringing this subject forward.

On the other hand, atrophy of the testicle is generally admitted to be common and to arise from many causes, as from acute orchitis, especially that accompanying or following parotitis in young men, also from chronic epididymitis. So again the testicle when retained in the inguinal canal or in the abdomen, or when in the scrotum with a congenital hernia, is small from pressure on its blood-vessels; also in cases of varicocele the testicle slowly becomes smaller.

English and continental observers are not agreed as to which of the testicles is the more usually retained, thus Godard collected twenty-two cases of undescent in the left and fourteen in the right. On the other hand, Ezgmanowski published forty-five cases occurring on the right side and only twenty-two on the left.

Mr C. B. Lockwood showed specimens to illustrate the transition of the testes :—(1) An anencephalic human fœtus, in which the scrotum was ill developed and the left gubernaculum unattached to the testicle. (2) Retained testicle (abdominal inclusion) from youth of eighteen. The testicle lay in the iliac fossa, but the processus vaginalis was 4 inches long and protruded from the external ring. The vas deferens looped down almost to the end of the processus, and a strong band of muscular fibres was attached to the end of the loop. (3) Gubernaculum of rabbit's embryo, showing ascending cremaster.

The Depth of the Cortex of the Kidney. By John Fletcher Little.

Having had occasion to investigate a question relating to the naked-eye appearances of the healthy kidney, I found that no two authors whose works were accessible to me agreed as to the normal depth of the cortical substance. In the last edition of Quain it is stated that it measures 2 lines. In the 1887 edition of Gray it is put down as being from one-third to one-half an inch; and in several authors—Turner, Heath, Cantlie, Bellamy, and Treves—I failed to find any measurement of it at all.

Under these circumstances I thought it best to make a collection of healthy kidneys, taken from the bodies of those who had died from diseases other than renal, or had met with fatal accidents whilst in perfect health. The accompanying series of twelve kidneys were selected by Dr Montague Murray, the pathologist to Charing Cross Hospital, and Mr Anthony Bowlby, pathologist to St Bartholomew's, as presenting all the characters of the healthy organ. The causes of death and ages of the patients are as follows :—Epithelioma of fauces (50), burn with phosphorus (68), fractured base of skull (35), atheroma of aorta (42), fractured skull and meningitis (30), compound fracture of thigh (77), fractured skull and jaw (63), cellulitis right hand and arm (39), injuries to head (30), phthisis (19), fractured base of skull (?).

The average dimensions of these kidneys agree with those which are regarded by all as normal, *i.e.*, 4 inches by 2 inches by 1 inch. The colour, capsules, weight, and consistence are also normal. What then is the average depth of the cortex lying between the capsule at the outer border and the bases of the pyramids of Malpighi as seen in these kidneys? It will be found that no measurement is so low as 2 lines and none so great as 6. They vary from a little under 3 lines to a little over 5 lines, and the great majority of them are 4 lines. In fact, the average is as nearly as possible 4 lines, or *one-third of an inch.*

All this is quite in accordance with my experience when, as Medical Officer to the Constabulary, I made many *post-mortems* on the bodies of those who had met with violent or sudden deaths. I do not remember any kidney which presented all the other signs of health, having a cortex of only two lines nor one which reached the extreme of half an inch. Should further research, supplemented by the experience of the members of the Anatomical Society, confirm this view, we must admit that the average depth of the normal cortex should be described as one-third of an inch.

In conclusion, it may not be out of place here to state that very vague ideas obtain both in the profession and outside it as to the length of a line. One well-known anatomist told me it was the eighth, and another that it was the sixteenth, of an inch. One dictionary declares that it is one-tenth, and another that it is the twelfth, of an inch. Would it not be well, with these facts in our mind, to adopt the metrical system, and have a standard of measurements affixed to the walls of every dissecting-room?

The Pterion in different Races of Men. By Arthur Thomson, M.B. Edin., Reader in Human Anatomy, University of Oxford.

Mr Thomson laid before the Society the results of his examination of this region in 413 skulls belonging to the Ethnological Collection in the University Museum at Oxford. By means of tracings, the method of obtaining which he described, he was able to demonstrate to the Society a persistency of type in certain races of the contours of the sutures around the pterion, the variations being due to alterations in the growth and development of the great sphenoidal wings and the squamous temporals. As perhaps the most marked examples of this fact, he cited the tracings of the Eskimo and Bushmen.

Mr Thomson then passed on to deal with the question of epipteric bones, and the occasional presence of a suture between the frontal and squamous temporal. In regard to the former he combated the view held by Sutton (*Jour. Anat. and Phys.*, vol. xviii.), that these epipteric bones were *always* present in the skulls of young persons under fifteen, and that their origin was due to a remnant of the cartilage of the orbito-sphenoid in the antero-lateral fontanelle.

His own observations lead him to believe that their origin did not differ from other Wormian bones, and in support of his view he stated that he had been unable to find any trace of cartilage in the antero-

lateral fontanelles in a number of fœtuses, some of which he showed to the Society.

The author, by a reference to the prevailing type of the races from which the skulls having these epipterics were taken, showed that for the most part they were to be looked upon as separated portions of the ali sphenoid or of the ant. inf. ang. process of the parietal, at the same time pointing out by numerous examples that in many cases at least the position of the epipteric ossicle was such that it could not be developed from the cartilage of the orbito-sphenoid. In addition, it was to be noticed that these epipterics were not unfrequently found in skulls in which Wormian bones were elsewhere found. Reference was also made to the difference in the fontanelles in children, and specimens were referred to in which little osseous nodules evidently of membrane origin were seen scattered throughout the fontanelle.

In conclusion, Mr Thomson said his observations with regard to some skulls differed widely from those of Mr Sutton.

Out of fifty skulls of young persons of fifteen and under belonging to the collection of the College of Surgeons only three skulls possessed epipterics on *both sides*, fourteen had epipterics on the *right side*, and six skulls display these bones on the *left side* only.

As the time was limited he only made a passing reference to the occasional occurrence of a suture between the frontal and squamoso-temporal. That he considered to be rather an accident, due in many cases to the fusion of a pre-existing epipteric bone with either the frontal or squamosal, as has been before shown, and he pointed out that in forty-one Australians and Tasmanians examined, races in which the pterion is narrow, the average width of the spheno-parietal articulation being only 6·1 mm., there did not occur a single instance of this abnormality, a fact which, he thought, went rather to prove that the occurrence of such a suture was more probably accidental than a reversion to a lower type.

Before concluding Mr Thomson said he should have liked to have referred in more detail to the racial difference, but time prevented.

Mr Sutton said that he was delighted to find that Mr Thomson had satisfied himself, and also the meeting, that the piece of cartilage which runs along the posterior border of the orbito-sphenoid is as he described it. He was never positive in his opinion that the epipteric bone had its origin in cartilage, and had expressed an opinion somewhat reservedly on that point. He should like to know the ages of the skulls in which Mr Thomson had failed to find the epipteric bone, because it is very possible that, working on a limited number of skulls, he had fixed the date of fusion too late: also, in those cases in which no epipteric bone existed, if the skulls were also examined from within as well as from without. Frequently the suture was visible from the interior of the skull, when no trace could be seen from without.

Professor G. B. Howes suggested that the development of the epipteric bone may have resulted from the increase in transverse diameter of the cranial roof, and pointed (in support of the supposition) to the duplication of the ossific centre in the expanded supra-

occipital of the Cetacea, and to the replacement under similar conditions of median by paired scutes, in the cranial roof of certain *Osteichthyes*. While supporting Mr Thomson's deductions, he deprecated the growing tendency towards attaching an important morphological value to secondary structures such as the one under consideration, and expressed the opinion that, in bringing the advocates of conflicting views face to face and fully discussing their differences, the Society was performing a work worthy of its institution and highest ambitions.

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PROCEEDINGS OF THE

ANATOMICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

JUNE 1888.

THE Summer Meeting of this Society was held at Cambridge, on Saturday, June 23, in the Anatomical Museum of the University.—Present, thirty-eight members and visitors. Professor HUMPHRY in the chair.

Professor MACALISTER showed a series of specimens which had been obtained from the Cambridge dissecting-room. They included *Abnormalities* of the skeleton, muscles, arteries, veins, and digestive tract.

Professor CURNOW showed an *Asymmetrical Skull* which presented the following abnormal features :—

The right half is obviously larger than the left half, there being a difference of nearly 2 inches in the measurement between the tips of the mastoid process and the interparietal suture on the two sides, the left measuring 16 inches and the right 18. The frontal suture is to the right of the junction of the interparietal sutures. The left half of the bony palate is larger than the right, the pre-maxillary suture distinct, and the basi-occipital has not yet joined the basi-sphenoid. On the left side there is nothing special to remark ; on the right side there is a distinct supra-orbital canal, running obliquely through the bone from without inwards for half an inch. Three large Wormian bones occupy the position of the ali-sphenoid and squamous parts of the temporal. The zygomatic process of the temporal bone is absent, the articulation of the jaw taking place with the most anterior of the three Wormian bones above-mentioned. The tympanic bone and the petrous portion of the temporal bone are incompletely developed, so that the auditory meatus is not separated by any bony partition from the carotid canal. In the occipital region a suture can be seen, probably marking off the limits between the membranous and the cartilaginous cranium. I exhibit this skull to show remarkable developmental anomalies of one side only.

The PRESIDENT was inclined to doubt whether the skull was hydrocephalic, and Mr WALTER PYE wished to know if the asymmetry was unusual.

Bulbo-cavernosi Muscles in Women.

Dr Symington exhibited some coronal sections through the anterior part of the pelvis of a female, about 50 years of age, to illustrate the position and relations of the bulbo-cavernosi, or so-called sphincter muscles of the vagina. Each muscle was about 1·5 mm. in thickness, and was placed external to the vestibular bulb. It was obvious, from their position and size, that they could have no appreciable effect in closing the vaginal orifice.

These sections also showed the relations between the pudendal and vaginal slits. The former is essentially a vertical mesial slit, while the latter is a transverse one. One of the sections passed through the bladder, the urethra just behind its external meatus, the vestibular bulbs, and the labia majora and minora. This section was rather more than $\frac{1}{2}$ an inch in front of the perineal body. Another section was made $\frac{7}{8}$ of an inch behind the preceding one. It divided the bladder, vagina, and perineal body.

In the more anterior of the two sections the pudendal cleft appeared in the form of a mesial slit about 1 inch in length, but above this it divided into two limbs, each limb being $\frac{3}{8}$ of an inch long. The whole space was thus Y-shaped. In the posterior section the vaginal cavity appeared as a transverse slit $1\frac{3}{8}$ of an inch in length.

These two sections were made upon the frozen cadaver, but the mass of tissue between them was hardened in spirit, embedded in celloidin, and cut with a large microtome into a series of moderately thin sections. An examination of this series showed that the two limbs into which the pudendal cleft divided gradually increased in length, and became more horizontal as they approached the vaginal orifice.

Demonstration of Auditory Air-Passages.

Dr Symington also showed a frozen section of the head, which he had found useful in demonstrating the air-passages connected with the ear. In preparing the specimen, the head was divided horizontally at the level of the external auditory meatuses. In front of these a cut was made downwards and forwards, so as to open the Eustachian tubes in their whole length. This oblique incision was joined at the naso-pharynx by a horizontal section made from before backwards a little above the floor of the nose. The specimen afforded a connected view of the external auditory meatus, tympanic cavity, Eustachian tube, naso-pharynx, nasal cavity, and nostril.

It was explained that sections of this kind were prepared more easily in children, in consequence of the more horizontal direction of the Eustachian tubes in early life.

Two Adult Temporal Bones, with Non-union of the Squamous and Petro-mastoid Portions.

Dr Symington met with these specimens in a disarticulated skull purchased from a dealer. The bones were evidently those of an adult,

as all the teeth were erupted, and the basi-occipital and basi-sphenoid had been separated by a saw.

None of the bones of the skull presented any peculiarity except the two temporals, and the condition of these was practically identical.

Each temporal bone consisted of two parts, one formed by the united petro-mastoid, tympanic, and styloid elements, the other by the squamosa. Although these two parts were movable one upon the other, they could not be completely disarticulated owing to some interlocking of the tegmen tympani with the squamosa.

In each specimen the line of union between the squamosa and the other parts of the temporal could be traced on the surface of the bone as follows :—From the incisura parietalis (or notch between the upper convex border of the squamosa and the upper edge of the mastoid) it passed downwards and forwards to the anterior part of the mastoid process, then turned upwards in the posterior wall of the external auditory meatus immediately behind the tympanic bone, and went over the inner extremity of the roof of the meatus to the Glaserian fissure. At the outer part of this fissure it lay between the tympanic plate and the post-glenoid process, but more internally it was separated from the tympanic plate by a process of the pars petrosa. From the inner end of the Glaserian fissure the suture could be traced backwards, on the inner surface, to the incisura parietalis.

Fig. 1 shows the line of union on the outer and under aspect of the bone.

Fig. 1.—*a*, squamoso-mastoid or external petro-squamous suture ; *b*, above inner extremity of Glaserian fissure ; *c*, post-auditory process of the squamous portion of the temporal.

The suture extending downwards and forwards on the outer surface of the bone from the incisura parietalis to the anterior border of the mastoid process (see *a*, fig. 1) is usually called the squamoso-mastoid suture. This name, however, is rather a misleading one, for the suture goes across the mastoid, and divides it into two portions. Since the mastoid part of the temporal bone is formed from the post-auditory process of the squamosa and the outer part of the pars

petrosa, it is more correct to call the suture between them the external petro-squamous. The line of union between the squamous and petrous portions, which is seen on the inner or cranial aspect of the temporal bone, may be termed the internal petro-squamous suture. In 1867, J. Gruber[1] of Vienna directed special attention to the dual origin of the mastoid and the practical importance of its outer aspect in connection with inflammatory conditions of the middle ear. The persistence to a greater or less extent of this suture in the adult is by no means uncommon.

Cloquet,[2] Aeby,[3] Leidy,[4] and others, give drawings showing its presence in the adult. Kirchner[5] examined 300 adult skulls in order to ascertain the frequency of its occurrence. He found it well marked on both sides in 5 per cent. of the cases. The suture is very distinct at birth, but generally becomes obliterated before the end of the second year.

On the left side the squamosa was disarticulated from the remainder of the temporal bone. In order to effect this, it was necessary to break a few small processes of the tegmen tympani. Fig. 2 shows an

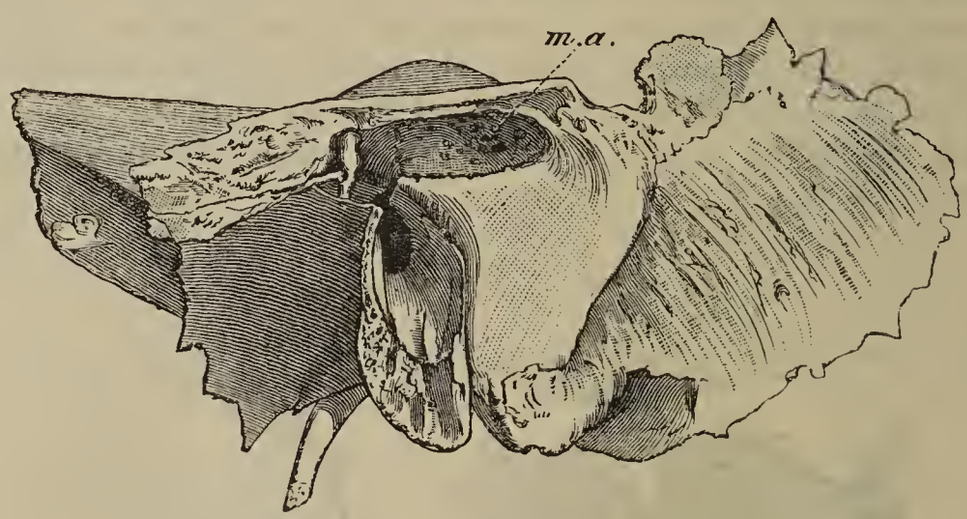

FIG. 2.—*m.a.*, mastoid antrum.

external view of the temporal bone after the removal of its squamous portion. The attic or upper chamber of the tympanic cavity and the mastoid antrum are exposed, as the squamous portion forms the outer wall of these spaces. The openings of the mastoid air-cells into the antrum are numerous but small, none of them being more than two or three millimetres in diameter. Below and behind the antrum is seen a smooth triangular surface, which articulated with a corresponding smooth surface on the inner aspect of the post-auditory process of the squamosa. A comparison of figs. 1 and 2 will serve to show the relation between the mastoid antrum and the outer surface of the temporal bone.

The Eustachian tube is generally described as being situated in

[1] *Wiener med. Wochenschrift*, 1867, s. 851.
[2] *Anatomie de l'homme*, 1821, tab. xiv. and xxvi.
[3] *Der Bau des menschlichen Körpers*, Leipzig, 1871, fig. 86.
[4] *Science*, vol. i. p. 507.
[5] *Arch. f. Ohrenheilkunde*, 14 Bd., 1879.

the receding angle between the petrous and squamous portions of the temporal. The tube, however, lies a little internal to that point, and has its walls formed entirely by the petrous and tympanic parts of the temporal.

The malleus remained in position after the left temporal had been disarticulated. Its processus gracilis was well developed.

Complete absence of osseous union between the squamous and the other parts of the temporal bone, although of normal occurrence in many mammals, would appear to be extremely rare in the adult human subject. Numerous cases have been described of partial persistence of the sutures between the different elements of the temporal bone, but I have failed to find any record of complete non-union, such as exists in these specimens. In the human subject the annulus tympanicus unites with the squamous sooner than with the petrous portion of the temporal, but in my specimens the tympanic bone, although separable from the squamosa, is firmly ossified to the pars petrosa.

Professor THANE considered that in this case the squamo-temporal was quite absent and replaced by Wormian bones.

Spinal and Cranial Nerves.

Dr GASKELL gave a short sketch of the results of his recent observations on the structure of the spinal and cranial nerves, and pointed out that the cranial nerves, with the exception of the nerves of special sense, were built up on the same plan as the spinal nerves, and arose from similar groups of nerve cells in the central nervous system. The cranial nerves differed, however, from the spinal in that they were divisible into two great groups, viz.,

Group I. Composed of the oculomotor, trochlearis, abducens, motor part of the trigeminal, and facial nerves,—a group composed of at least four complete segmented nerves, each of which had lost their posterior root and root ganglion, but retained to a greater or less extent the rest of the components of a special nerve.

Group II. Composed of the sensory part of the trigeminal, glosso-pharyngeal, vagus, spinal accessory, and hypoglossal nerves—nerves which make up a large group of at least five complete segmental nerves, which are in origin partly cranial and partly spinal, which are extensive in their distribution, which have lost none of their components, but the different components have largely become separated to four separate nerve roots.

The author then proceeded to point out that an explanation must be found in the past history of the vertebrata for the two great and most striking peculiarities of these two groups of cranial nerves, and he ventured to put forward a theory to account for the degeneration observed in Group I., leaving for a future occasion the consideration of the peculiarities of Group II.

Taking first into consideration the structure and development of the spinal cord, he suggested that the segmental arrangement of the nerves was bound up with a segmental arrangement of the groups

of ganglion cells which gave origin to those nerves; so that, as far as the nervous part of the spinal cord was concerned, it might be looked upon as a bilateral chain of ganglia, which were connected with each other by nerve fibres, and gave origin to a series of segmental nerves. In addition to this bilateral chain of ganglia, there is found in the spinal cord a meshwork of supporting tissue, which forms a tube in the meshes of which the nervous elements are inserted. He ventured to suggest that this tube of supporting tissue was formed by the folding over of the medullary plate to form the neural canal, and he pointed out how the non-nervous character of this tube is exemplified in the roof of the 4th ventricle, in the roof of the sinus rhomboidalis of birds, and in the neurenteric canal, by means of which the neural canal is continuous with the alimentary canal.

Further, he gave reasons to show that this neural canal had originally an anterior opening, which was at the extremity of a small tube leading into the cavity of the infundibulum, the walls of which, by being pressed down on to the tuber cinereum, had come together, and so occluded the opening of the tube.

He pointed out how the arrangement of the nervous tissue of the brain and spinal cord around this tube of supporting tissue corresponded to the arrangement of the invertebrate nervous system, in which the cerebrum, cerebellum, and those parts of the brain which are dorsal to this tube represent the supra-œsophageal ganglia and give origin to the nerves of special sense; the crura cerebri and the peduncles of the cerebellum represent the œsophageal commissures; the origins of Group I. of the cranial nerves, the infra-œsophageal ganglia; the medulla oblongata and spinal cord, the ventral chain of ganglia; while the tube itself represented the alimentary canal of the invertebrate.

Finally, he suggested the degeneration observed in Group I. of the cranial nerves was associated with the loss of the original alimentary canal and mouth parts, while the peculiarities of distribution and origin of Group II. were associated with the formation of the new alimentary canal.

The author stated that the full paper will appear shortly in the *Journal of Physiology*.

Professor Howes could not accept Dr Gaskell's conclusions. He thought the arthropods were not the vertebrate ancestors, but that worms were in the direct line.

Dr Alexander Hill wished to know whether Dr Gaskell considered the neuroglia to have been derived from mesoblast, and the nerve substance from epiblast.

Mr Sutton could not account for Auerbach's and Meissner's plexuses, and thought them difficulties in the path of those who assumed that all nerve substances sprang from epiblast.

Dr Gaskell, in replying to the various questions, wished to point out that it was possible to look upon the spinal cord as not necessarily a nervous tube.

PROCEEDINGS OF THE

ANATOMICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

NOVEMBER 1888.

The First Annual Meeting of this Society was held on Wednesday, November 7, 1888, in the Library of St Thomas's Hospital. The President, Professor Humphry, F.R.S., in the chair. The following gentlemen were elected officers for the ensuing year:—*President*—George Murray Humphry, F.R.S. *Vice-Presidents*—Sir William Turner, F.R.S.; Daniel John Cunningham, M.D.; J. D. Thane. *Treasurer*—Charles Stewart. *Secretaries*—C. B. Lockwood (England); David Hepburn, M.D. (Scotland); H. St John Brooks, M.D. (Ireland). *Council*—William Mitchell Banks, M.D.; John Curnow, M.D.; J. N. C. Davies-Colley; John Struthers, M.D.; Frank Beddard; John Cleland, M.D., F.R.S.; G. B. Howes; John Langton; John Wood, F.R.S.; A. M. Paterson, M.D.; Thomas Pickering Pick; Johnson Symington, M.D.; R. W. Reid; Rickman J. Godlee; Peter Redfern, M.D.; Frederick Treves; Alexander Macalister, F.R.S.; Bertram Windle; Alfred H. Young; Arthur Thomson.

The auditor's report had not been completed, but the Secretary was able to announce that, after all expenses had been paid, there was still a balance in hand. It was also announced that there were 125 members upon the books of the Society.

Mr Gordon Brodie showed a specimen of an *Abnormality of the Aortic Arch*, from a dissecting-room subject. Although the varieties which it shows have all been described before, no case is on record which is precisely similar in the way in which the branches are combined, and the variations are not limited to the main trunk.

The first noticeable point is the absence of the innominate artery, and in its place a short thick trunk, which gives off two branches, ascending on either side of the trachea to take the place of the common carotids; on tracing up that on the right side, an artery is noticed given off which runs up and enters the foramen in the transverse process of the cervical vertebra (4th), in fact, the vertebral.

Next in order coming off from the arch is the vertebral of the left side, which enters the foramen in the transverse process of the 5th cervical as it courses up, and in the root of the neck a branch is given off which, passing inwards and upwards beneath the common carotid, enters the thyroid gland.

Another branch given off from the left subclavian in its first part was traced upwards to end in the tissue between the transverse processes, and was at first thought to be a second root to the vertebral; but dissection proved the fallacy. Lastly, the right subclavian was

arising from the arch as a fourth branch, and passed behind œsophagus and trachea. The right inferior thyroid came off normally.

Professor Humphry read a paper on the *Angle of the Neck of the Thigh-Bone with the Shaft at various Ages and under various Circumstances*, which is printed *in extenso* on p. 273 of the *Journal of Anatomy and Physiology*. He gave numerous measurements, from which he deduced the following conclusions :—

1. That the angle formed by the neck of the thigh-bone with the shaft varies considerably in different persons at the same age.

2. That it is smaller in short bones than in long bones, and that it is usually small when the pelvis is wide, the combination of these two conditions rendering it usually smaller in men than women.

3. That the angle decreases during the period of growth, before and after birth ; but that after growth has been completed it does not usually undergo any change, even if life be prolonged to extreme old age, the commonly received opinion on this point being erroneous. Some change may take place in exceptional rare cases ; but, as a rule, the angle remains the same from the adult period till death, at whatever age that event may occur.

4. That if, during growth, the limb be relieved of the weight of the body, as in the bed-ridden state, in paralysis, or after amputation in the thigh, the angle of the neck with the shaft usually retains the open form of early life, or may, and frequently does, become wider.

Professor G. B. Howes then read a paper on *The Intra-narial Epiglottis*, which is printed *in extenso* in the *Journal of Anatomy and Physiology*, p. 263.

The author records the presence of an intra-narial larynx in the common Rabbit, the conditions being similar to those previously described by him in the Hedgehog. He gives a *résumé* of all that is known upon the subject, and shows that the condition in question has been observed in eight of the twelve leading orders of living mammals. He deduces the belief that the epiglottis was primarily intra-narial, and that the velum palati was originally developed for purposes of completely shutting off the respiratory passages—the condition predominant among mammals having been due to secondary adaptation, more especially of the epiglottis, in phonation. He records the presence, in the Rabbit, of a small hyo-epiglottidean muscle which was paired as in some cetaceans (*Balænoptera*, *Globiocephalus*), and discusses its functional significance.

Professor Thane said that the arrangement described by Mr Howes was normal in man, in whom, during nasal breathing, the laryngeal orifices and epiglottis were brought up into the naso-pharynx. He argued that the epiglottis was mainly used in phonation. He could not agree that the condition described was the primitive condition.

Mr J. Bland Sutton referred to Dr Champney's paper on "Respiration in New-Born Children." He had found the epiglottis lying behind the palate in five fœtuses.

Mr Hill thought that food passed by the side of the epiglottis.

Mr A. Thomson could confirm Mr Howe's observation as regards sheep, and to a lesser extent as regards man.

Professor Macalister also confirmed as regards man. He thought the lid cover idea of the function of the epiglottis was exploded.

A paper was read by Mr Bland Sutton on the *Nature of the Vocal Cords and the Hyo-Epiglottic Muscle*, in which facts were adduced in support of the contention (1) that the true vocal cords are the result of the tendinous metamorphosis of a portion of the thyro-arytenoideus muscle; (2) the false vocal cords with the cuneiform cartilages of Wrisberg are the degenerate representatives of a piece of cartilage which originally connected the epiglottis with the cornicula laryngis (Santorini's cartilage); (3) that the hyo-epiglottic ligament is the degenerate representative of the hyo-epiglottic muscle so largely developed in whales, horses, ant-eaters, many monkeys, and other mammals, sometimes even re-appearing in man. The demonstration was aided by actual dissections prepared by Mr William Pearson for preservation in the museum, at the suggestion of Professor Stewart. The paper concerned itself with actual questions of facts, and speculation was studiously avoided. (*In extenso*, p. 256 of *Journal*.)

Mr A. Thomson said cartilages of Santorini were very large and constant in the negro.

Professor Alex. Macalister could not confirm this observation.

Professor Charles Stewart doubted that yellow tissues could replace a muscle, as Mr Sutton argues for the vocal cord.

Mr Howes agreed with Mr Sutton, and pointed out references which had been overlooked.

Mr J. Bland Sutton, in reply, mentioned muscles in which there was elastic tissue.

Mr R. W. Reid read a paper on the *Relations between the Superficial Origins of the Spinal Nerves from the Spinal Cord and the Spinous Processes of the Vertebræ*. Owing to the present somewhat insufficient data afforded concerning the exact position in the adult of the superficial origin of the spinal nerves from the cord in relation to the surface of the body, he made a series of six dissections to try to localise their position more positively. He said that although the length and obliquity of the spinous processes varied a good deal, yet their posterior ends might fairly be made use of for the purpose. From examination of a number of cords, he found that for all practical purposes the posterior roots and the anterior roots of nerves belonging to the same segment left the cord at the same level. He then described the method in which the investigations were conducted —firstly, when the body was placed in the horizontal; and secondly, in the upright position. These investigations were conducted with mathematical accuracy, and the result arrived at was that the superficial origin of any individual spinal nerve had no fixed and definite relation to the apex of one, or to the apices of two of the spinous processes, or the space intervening between two, as might be supposed from the tables of Nuhn and Jadelot, but that its position varied considerably. The following was a summary of the limits within which he found

that the posterior and anterior nerve roots took their superficial origins from the cord in relation to the posterior ends of the spinous processes. (*a* signifies the highest point of origin; *b* the lowest point of origin.) Second cervical: (*a*) a little above the posterior arch of atlas; (*b*) midway between the posterior arch of atlas and the spine of axis. Third cervical: (*a*) a little below posterior arch of atlas; (*b*) junction of upper two-thirds with lower third of spine of axis. Fourth cervical: (*a*) just below upper border of spine of axis; (*b*) middle of spine of third cervical. Fifth cervical: (*a*) just below lower border of spine of axis; (*b*) just below lower border of spine of fourth cervical. Sixth cervical: (*a*) lower border of spine of third cervical; (*b*) lower border of spine of fifth cervical. Seventh cervical: (*a*) just below upper border of spine of fourth cervical; (*b*) just above lower border of spine of sixth cervical. Eighth cervical: (*a*) upper border of spine of fifth cervical; (*b*) upper border of spine of seventh cervical. First dorsal: (*a*) middle of interval between spines of fifth and sixth cervical; (*b*) just above spine of first dorsal. Second dorsal: (*a*) lower border of sixth cervical; (*b*) just above lower border of spine of first dorsal. Third dorsal: (*a*) middle of spine of seventh cervical; (*b*) lower border of spine of second dorsal. Fourth dorsal: (*a*) just below upper border of spine of first dorsal; (*b*) junction of upper third and lower two-thirds of spine of third dorsal. Fifth dorsal: (*a*) upper border of spine of second dorsal; (*b*) junction of upper fourth and lower three-fourths of spine of fourth dorsal. Sixth dorsal: (*a*) lower border of spine of second dorsal; (*b*) just below upper border of spine of fifth dorsal. Seventh dorsal: (*a*) junction of upper third and lower two-thirds of spine of fourth dorsal; (*b*) just above lower border of spine of fifth doral. Eighth dorsal: (*a*) junction of upper two-thirds and lower third of interval between spines of fourth and fifth dorsal; (*b*) junction of upper fourth and lower three-fourths of spine of sixth dorsal. Ninth dorsal: (*a*) middle of interval between spines of fifth and sixth dorsal; (*b*) upper border of spine of seventh dorsal. Tenth dorsal: (*a*) middle of interval between spines of sixth and seventh dorsal; (*b*) middle of spine of eighth dorsal. Eleventh dorsal: (*a*) junction of upper three-fourths and lower fourth of spine of seventh dorsal; (*b*) just above spine of ninth dorsal. Twelfth dorsal: (*a*) junction of upper fourth and lower three-fourths of spine of eighth dorsal; (*b*) just below spine of ninth dorsal. First lumbar: (*a*) middle of interval between spines of eighth and ninth dorsal; (*b*) lower border of spine of tenth dorsal. Second lumbar: (*a*) middle of spine of ninth dorsal; (*b*) junction of upper third and lower two-thirds of spine of eleventh dorsal. Third lumbar: (*a*) middle of spine of tenth dorsal; (*b*) just below spine of eleventh dorsal. Fourth lumbar: (*a*) just below spine of tenth dorsal; (*b*) junction of upper third and lower two-thirds of spine of twelfth dorsal. Fifth lumbar: (*a*) junction of upper third and lower two-thirds of spine of eleventh dorsal; (*b*) opposite middle of spine of twelfth dorsal. Sacral nerves—First sacral: (*a*) lower border of spine of eleventh dorsal; (*b*) lowest point of origin of fifth sacral, the lower border of spine of first lumbar.

7.

Rules and List of Members

OF THE

ANATOMICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

JANUARY, 1889.

LONDON:
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1889.

CONSTITUTION.

1. That the name of the Society be "The Anatomical Society of Great Britain and Ireland."

2. "That the object and scope of the Society be the Anatomy, Embryology, and Histology of Man and of Animals in so far as they throw light upon the structure of Man."

3. That the officers of the Society shall consist of a President, three Vice-Presidents, a Treasurer, a Council of twenty, and three Secretaries.

4. That the officers be elected by ballot at each annual meeting.

5. That as far as possible, in the election of President and Vice-Presidents, there shall be two representatives of England and one each from Scotland and Ireland.

6. That there shall be a Secretary for England, one for Scotland, and one for Ireland.

7. That the Council shall, from amongst their number, select six members to form, together with the President, Vice-Presidents, Treasurer, and Secretaries, a Committee of Management.

RULES.

1. Those interested in the science of Anatomy shall be eligible for election as Members of the Anatomical Society of Great Britain and Ireland.

2. Candidates shall be proposed by three members, of whom one shall have personal knowledge of the Candidate.

3. The name and address of each Candidate, together with the names of his proposers, shall be announced at a meeting of the Society, and the ballot shall take place at the next meeting.

4. Not less than one full week before the meeting at which the ballot is to take place, the Secretary shall send to every member of the Society the name and address of each Candidate, together with the names of his proposers.

5. Any member wishing to vote shall return to the Secretary, on or before the day of meeting, this notice with the name of any Candidate to whom he objects crossed out.

6. One black ball in five shall exclude.

7. Each member of the Society shall pay an annual subscription of Ten shillings and sixpence.

8. The subscription is payable in advance, and becomes due on the 1st of November of each year.

9. Any member whose subscription is not paid within twelve months after it has become due, shall, if the

Council see fit, be removed from the membership of the Society.

10. The Committee of Management shall fix the time and place of each meeting.

11. The Committee of Management shall determine the business of each meeting.

12. Each member shall have the privilege of introducing a visitor or visitors at any ordinary meeting of the Society. The names of visitors shall be entered into the attendance book, after which the visitors shall be permitted to join in the discussions of the Society.

13. The first meeting of the Society in the winter session shall be the Annual General Meeting.

14. One fourth of the Members of the Council shall be replaced at each annual meeting by an equal number of members chosen from the Society at large.

15. The Council shall submit at each annual meeting a list of the members whom they recommend as officers during the ensuing year.

16. The Committee of Management shall arrange with the 'Journal of Anatomy and Physiology' for the publication of the Proceedings of the Society, and of the papers read before the Society.

17. If at any time the Council shall be of opinion that the interests of the Society require the expulsion of a member, they shall submit the question to a Special General Meeting, at which, if two thirds of the members of the Society vote for the expulsion of the member in question, his subscription for the current year shall be returned to him, and he shall thereupon cease to be a

member of the Society. The voting at such special meetings shall be by ballot, and not less than twenty members shall form a quorum.

18. New Laws may be proposed by the Council at the annual meeting of the Society, or at a meeting specially summoned for the purpose, notice of the proposal being sent to each member of the Society with the summons to the meeting. At such meeting not less than twenty members shall form a quorum, and for the adoption of any rule a majority of two thirds of the members present shall be required in its favour.

19. Any member may make suggestions to the Council regarding changes in the laws, by letter addressed to the Secretaries.

20. That the papers read before the Society become the property of the Society, and in the event of it being decided not to publish a paper it may be returned to the author by the Secretary. Further, after the publication of a paper any original drawings illustrating the same be returned to the author.

21. That one Secretary retire each year.

LIST OF MEMBERS.

Abraham, Phin. S., M.D., 11, Nottingham Place, W.

Allingham, Herbert, 25, Grosvenor Street, Grosvenor Square, W.

Anderson, Wm., 25, Grosvenor Street, Westminster, S.W.

Ashdown, H. H., M.B., 3, North Charlotte Street, Edinburgh.

Banks, Alfred, Westfield Park, Harold's Cross, Dublin.

Banks, W. Mitchell, M.D. (*Council*), 28, Rodney Street, Liverpool.

Beddard, Frank E. (*Council*), Zoological Society's Gardens, Regent's Park, London, N.W.

Bellamy, Edward 17, Wimpole Street, Cavendish Square, W.

Bennett, Henry, 1, Chesterfield Street, Mayfair, W.

Bennett, E. H., M.D., 26, Lower Fitzwilliam Street, Dublin.

Bermingham, Ambrose, M.B., School of Catholic University, Dublin.

Berry, Jas., 60, Welbeck Street, Cavendish Square, W.

Black, James, 16, Wimpole Street, Cavendish Square, W.

Boyd, Stanley, 27, Gower Street, Bedford Square, W.C.

Brodie, Gordon C., The College, Middlesex Hospital.

Brooks, H. T. John, M.D. (*Secretary for Ireland*), School of Physic, Trinity College, Dublin.

Broomfield, Humphry, Carmichael College, Dublin.

Brown, Macdonald, 6, Atholl Place, Edinburgh.

Buchanan, Prof. A. M., M.A., M.D., 98, St. George's Road, Glasgow.

Cagney, James, 21, King Street, Portman Square, W.

Chambers, James, M.D., Queen's College, Belfast.

Charles, Prof. J. T., Queen's College, Cork.

Clarke, J. J., St. Mary's Hospital.

Clarke, W. Bruce, M.A., M.B., 46, Harley Street, W.

Cleland, John, M.D., F.R.S. (*Council*), 2, The College, Glasgow.

Collier, Mayo, 28, New Cavendish Street, Cavendish Square, W.

Collins, Wm. J., M.D., 1, Albert Terrace, Regent's Park, N.W.

Cook, Thomas, 40, Brunswick Square, W.C.

Cross, F. Richardson, Chandos Villa, Bristol.

Cadman, A. W., King's College, Strand.

Cunningham, D. J., M.D. (*Vice-President*), School of Physic, Trinity College, Dublin.

Curnow, J., M.D. (*Council*), 3, George Street, Hanover Square, W.

Curtis, James, Western Medical School, Glasgow.

Dane, R., Middlesex Hospital, W.

Davies-Colley, J. N. (*Council*), 36, Harley Street, W.

Douty, E. H., Demonstrator of Anatomy, Cambridge.

Duncan, H., The Examination Hall, Thames Embankment.

Flemming, Percy, 35, Regent's Park Road.

Fletcher, G. A. C., Charterhouse, E.C.

Fraser, Alex., M.B., Royal College of Surgeons, Dublin.

Freeman, R. Austin, Middlesex Hospital, W.

Gadow, H., Ph.D., M.A., Museum of Zoology and Comparative Anatomy, Cambridge.

Galton, John C., New University Club, St. James's Street, S.W.

Godlee, Rickman J. (*Council*), 81, Wimpole Street, W.

Griffith, Thomas Wardrop, M.D., Yorkshire College, Leeds.

Groves, James W., The Museum, King's College.

Gunn, Donald, University College, Gower Street.

Harris, Vincent D., M.D., 39, Wimpole Street, W.

Harsant, W. H., 16, Pembroke Road, Clifton, Bristol.

Haughton, Samuel, M.D., F.R.S., Trinity College, Dublin.

Hensman, Arthur, 31, Harley Street, Cavendish Square, W.

Hepburn, David, M.B. (*Sec. in Scotland*), 16, Napier Road, Edinburgh.

Herringham, W. P., M.B., 13, Upper Wimpole Street, W.

Heuston, Francis, Carmichael College, Dublin.

Hill, Alex., M.D., Master of Downing, Cambridge.

Hill, W., M.B., 37, Cornwall Road, Bayswater, W.

Howden, R. H., M.B., Demonstrator of Anatomy, The University, Edinburgh.

Howes, G. B. (*Council*), Biological Laboratory, Science and Art Department, South Kensington.

Humphry, Geo. M., M.D., F.R.S. (*President*), Grove Lodge, Cambridge.

Hutchinson, J., jun., 15, Cavendish Square, W.

Jackson, Hatchett, M.A., Museum, Oxford.

Jessop, Walter, 73, Harley Street, W.

Jones, Lewis, M.D., 6, West Street, Finsbury.

Kenny, Alexander S., 41, Guildford Street, Russell Square.

Klein, E., M.D., F.R.S., 19, Earl's Court Square, S.W.

Lamont, J. C., M.B., The University, Edinburgh.

Lane, Ernest, 10, Cambridge Street, Hyde Park.

Lane, W. Arbuthnot, 14, St. Thomas's Street, S.E.

Langton, John (*Council*), 62, Harley Street, W.

Lawson, Bernard, 12, Harley Street, W.

Little, T. E., Trinity College, Dublin.

Lockwood, C. B. (*Secretary for England*), 19, Upper Berkeley Street, W.

Long, Sinclair, Manor House, Dundrum.

Macalister, Alex., F.R.S. (*Council*), Harvey Road, Cambridge.

Mackay, J. T., M.D., Demonstrator of Anatomy, The University, Glasgow.

Mahon, R. B., M.D., Queen's College, Cork.

Makins, George Henry, 2, Queen Street, Mayfair.

Marsh, Howard, 30, Bruton Street, W.

Mears, W. P., M.D., University College of Medicine, Newcastle-upon-Tyne.

Milligan, William, M.B., Demonstrator of Anatomy, The University, Aberdeen.

Morgan, John H., 31, Grosvenor Street, W.

Morris, Henry (*Council*), 2, Mansfield Street, Portland Place, W.

Mott, F. W., M.D., Charing Cross Hospital, W.C.

Moullin, Chas, M., 69, Wimpole Street, W.

Oliver, M. J., M.B., Royal College of Surgeons, Edinburgh.

Owen, Edmund, 49, Seymour Street, Portman Square, W.

Page, Herbert Wm., M.B., 146, Harley Street, W.

Paterson, A. M., M.D. (*Council*), University College, Dundee.

Pick, Thos. Pickering (*Council*), 18, Portman Street, W.

Poland, John, 16, St. Thomas's Street, S.E.

Pollard, Bilton, University College, Gower Street, W.C.

Power, D'Arcy, 26, Bloomsbury Square, W.C.

Purser, J. Malet, M.D., Trinity College, Dublin.

Pye, J. P., M.D., Queen's College, Galway.

Ramsay, A. M., Demonstrator of Anatomy, The University, Glasgow.

Redfern, Prof. (*Council*), Queen's College, Belfast.

Reid, R. W. (*Council*), 77, Lambeth Palace Road, S.E.

Robertson, Charles, Museum, Oxford.

Rolleston, H. D., St. Bartholomew's Hospital.

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Scott, J. Alfred, Carmichael College, Dublin.

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Shore, Thos. W., M.D., Physiological Laboratory, St. Bartholomew's Hospital, E.C.

Sibley, W. K., 7, Harley Street, W.

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Symington, J., M.D. (*Council*), 2, Greenhill Park, Edinburgh.

Thane, Edgar Herbert, University College, Gower Street, W.C.

Thane, Geo. D. (*Vice-President*), University College, Gower Street, W.C.

Thomson, A., M.B. (*Council*), The Museum, Oxford.

Thomson, D'Arcy, University College, Dundee.

Thomson, Wm., Trinity College, Dublin.

Torrens, J., M.D., 32, Harcourt Street, Dublin.

Treves, F. (*Council*), 6, Wimpole Street, Cavendish Square, W.

Turner, G. R., 49, Green Street, Park Lane, W.

Turner, Sir William, F.R.S. (*Vice-President*), 6, Eton Terrace, Edinburgh.

Wallis, F., M.B., 18, St. James's Street, Piccadilly, W.

Walsham, W. J., 27, Weymouth Street, W.

WILLETT, EDGAR, M.A., M.B., 60, Welbeck Street, Cavendish Square, W.

WILLIAMS, CAMPBELL, 62, Welbeck Street, W.

WINDLE, B., M.D. (*Council*), Queen's College, Birmingham.

WOOD, JOHN, F.R.S. (*Council*), 61, Wimpole Street, W.

YOUNG, A. H., M.B. (*Council*), Owens College, Manchester.

YOUNG, R. BRUCE, M.A., M.B., Demonstrator of Anatomy, The University, Glasgow.

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PROCEEDINGS OF THE

ANATOMICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

FEBRUARY 1889.

An Ordinary Meeting of the Society was held on Wednesday, February 6, at 5 p.m., at the Middlesex Hospital. The President, Professor Humphry, in the chair. Present, upwards of forty members and visitors. The minutes of the previous meeting were read and confirmed. Robert Bowles, M.D., &c., was announced to have been elected a member of the Society.

Mr Arthur Hensman showed a specimen to prove that the *Dorsal Artery of the Foot* crossed over the middle cuneiform bone, and not as is usually described in the text-books.

Dr St John Brooks showed for Professor Cunningham a further series of models to illustrate the *Topography of the Skull*, and read the following note by Professor Cunningham :—

Exhibition of Models.

1. Last winter Professor Cunningham exhibited to the Society a number of models, illustrative of cranio-cerebral topography.
2. These comprised the heads of two adults and several children.
3. He explained that he aimed at preparing a complete set, which would illustrate the changes which take place in the relations between cranial bones and cerebral convolutions during the growth of both.
4. At that time the series was far from complete, but now only four models are required to finish the set, viz., 2, 3, 7, 9.
5. In all he has prepared 19 human and 4 apes.
6. Up to present has failed to model the fœtal brain below the sixth month, and has had to content himself with accurate drawings of all heads younger than this. One of these, from the head of a fourth month fœtus, he begs leave to submit to the Society.
7. The difficulties connected with the safe transit of these models has prevented Dr Cunningham sending more than four models. He

has selected, however, those which he considers to be the most interesting and characteristic, viz.:—

Head of child, 6 months old.
„ „ new born, by breach presentation.
„ fœtus, 6 months.
„ ape, *Macacus rhesus*.

8. The methods adopted in preparing smaller ape brains are somewhat different from those previously detailed. Very little difficulty is experienced in hardening them without shrinkage, and nothing in these cases but spirit of different strength is employed.

A New Method of Mounting the Spine. By Prof. D. J. Cunningham.

When we attempt to articulate the separate and macerated bones of the spine so as to reproduce faithfully the natural curvature, we encounter almost insuperable difficulties. We have no means of accurately judging, in the absence of the intervertebral discs, the exact positions which the different vertebræ should take in relation to each other.

Some may consider that this is a matter of no great importance, seeing that during life there is no condition of the spinal form which may be considered absolutely characteristic. "There is not a gesture, not a change of attitude, which is not accompanied by some alteration in the curvature of the vertebral column. Our very respiratory movements, gentle and unconsciously performed as they are, meet with a response in alterations of curvature; and in the dead, when the spine is removed from the influence of the muscles—those contracting guy-ropes which help to keep it erect—when removed also from the influence of gravity, the changes which it undergoes must be very considerable."[1]

The various schematic representations which have been given, with the view of representing the typical spinal form in the living, are all more or less fanciful. That most in favour is the Horner-Meyer schema, which represents the spine in the stiff military position. This undoubtedly is a forced condition of the spine, and largely due to muscular contraction. As Krause remarks, it is only suitable for a woman well advanced in pregnancy.

The method which I have employed in articulating the spine aims at reproducing the curvature of the vertebral column as it exists in the dead. In my *Cunningham Memoir*, published by the Royal Irish Academy, I have shown that the spine may be removed from the body, and suffer no material change in its curvature, so long as the ligaments and muscles which surround it are preserved intact. This, then, is the first step in the process. The next consists in freezing the specimen, and dividing it with a saw in the mesial plane. When this is done, and while the parts are all immovably fixed in their true relative positions, an accurate tracing is taken of the cut surface. The spine is then macerated, and when the bones are clean

[1] *Cunningham Memoirs*, No. 2, by D. J. Cunningham.

a copy of the original tracing is spread out upon a board of suitable shape and size, and fixed with drawing-pins. The vertebræ are mounted on the surface of the tracing—each in its own appropriate place—and fixed to the board by two slender nails driven through each bone.

Merkel has endeavoured to reconstruct the lumbar column upon paper. He obtains an outline of the profile view of each vertebra which, from the accurate means which he adopts, may be regarded as being geometrically correct. The outlines of the vertebræ are then put in position. He assumes, in doing this, that in the attitude of anatomical rest the central points of the opposing surfaces of the articular processes must coincide with each other. Having secured the accurate coincidence of these points, he shifts the bodies of the vertebræ until they fall into a uniform curve. Upon his own showing, however, he is only able in this way to fix the position of three of the lumbar vertebræ. The first and fifth members of the group he places somewhat arbitrarily. In the case of the first lumbar vertebra, he seeks help from the Horner-Meyer schema; whilst he gives position to the fifth lumbar vertebra more or less by the eye.

Merkel claims for his highly ingenious method that it enables us to appreciate the relation which the several parts of a vertebra bear individually to the curve, and so it does. I think I may claim the same advantage for the method which I have had the honour of submitting to the Anatomical Society.

Dr St John Brooks also showed for Professor Cunningham, the *Centenarian Skeleton* of a Man aged 105 years. The angle of the neck of the femur was wide, and the bones of the skull, vertebral column, and sternum synostosed. The lower jaw contained some teeth, and its angle was rather oblique.

Professor Thane and the President made some remarks; and the latter said the specimen was quite unique. He possessed the femur of a woman aged 103. He observed that in this case the bones had upon them outgrowths due to ossification of tendons. As life advanced bone was laid down on the exterior with some removed from interior. The specimen also showed that rheumatoid arthritis was not incompatible with long life. The bones were decidedly heavy. Well developed and tall people lived the longest.

Messrs Anderson and Makins read their paper on *Experiments on Cranio-Cerebral Topography*, which will be found in full on page 455 of the *Journal*.

The investigations were undertaken with a view to the elaboration of a simpler and more exact series of guiding-lines to the cerebral convolutions of the motor region, and the establishment of "local points" corresponding to certain parts of the principal fissures in this locality.

A preliminary series of observations consisted in the exposure of the dura mater by the removal of one half of the skull-cap. The

dura was carefully divided by a longitudinal incision to allow an efficient examination of the convolutions; this effected, the membrane was sutured, and an outline of the subjacent sulci was traced on its surface with a thick coloured mucilage. The skull-cap was replaced, and the head so turned as to bring the mapped-out dura in contact with the bone. In this way an imprint of the tracing was transferred to the inner surface of the bones. A series of punctures in the transferred lines now allowed an accurate estimate to be formed of the relation of the sulci to the bony case. Indications obtained by this method in six cases led to the projection of certain fixed lines, which are drawn as follows:—

1. *Sagittal*, drawn from the glabella at a level corresponding to the highest point of the orbital arch (glabellar point), to the external occipital protuberance (inion). The central point in this line is called the mid-sagittal point.

2. *Frontal*, drawn from a point (pre-auricular point) corresponding to the upper margin of the external auditory meatus, and immediately anterior to the tragus, to the sagittal point.

3. *Squamosal*, drawn from the external angular process at a level with the highest limit of the orbital arch (angular point), to a point (squamosal point) fixed at the junction of the middle with the lower third of the frontal line.

Punctures made at certain proportional distances in these lines, through which pins were introduced into the brain, resulted in the establishment of a number of focal points which may be used for the determination of the position of the most constant and important sulci in the motor region. These points were elaborated from observations made on both sides of the head in twenty cases, thus amounting to forty in number. In spite of the infinite variety of contour met with, it has been found possible so to arrange the points as to make them focal for all the probable variations, a trephine of 1 inch diameter being employed.

1. *Fissure of Rolando.*—An oblique line is taken commencing $\frac{3}{8}$ of an inch posterior to the sagittal point, carried obliquely downwards and forwards across the frontal line to a point $\frac{3}{8}$ of an inch anterior it in the squamosal line. The line so marked out was, for convenience sake, carried into the superior longitudinal and the Sylvian fissures respectively, the narrowness of the bridge above, and the varying width of the gyrus connecting the ascending parietal and frontal convolutions below, making the introduction of fixed points above and below a source of complication apparently both unnecessary and undesirable.

2. *Fissure of Sylvius.*—This follows closely the direction of the squamosal line. The varying points in its course are determined by subdivision of the line into proportional lengths. The commencement lies at $\frac{5}{12}$ of the distance between the angular and squamosal points measured from before, the bifurcation at $\frac{7}{12}$ of the same distance, while the termination corresponds to a point fixed by continuation of the squamosal line to a distance behind the frontal line equal to that

between the frontal line and the bifurcation, and continued upwards for $\frac{1}{2}$ an inch at its termination in a direction parallel to the frontal line. The division of the squamosal line into twelfths is readily effected by using a tape measure on which the inches are graduated in twelfths.

3. *External Parieto-occipital Sulcus.*—The position of this is determined by a point fixed at $\frac{7}{12}$ of the distance between the mid-sagittal and occipital points, measuring from the former. (Details as to the fixation of these points will be found in the paper on p. 455 of the *Journal of Anatomy and Physiology.*)

For the frontal and intraparietal sulci no indications of sufficient regularity for formulation could be procured.

During the course of the investigation, the desirability of obtaining some information as to the fixity of position of the various sutures and eminences in skulls of equal dimensions, at present in use as land-marks, became apparent. With a view to collecting some details on this subject, thirty normal skulls were measured, giving the following results, correction being made for the varying dimensions of the skulls (for tabulated details see p. 465 of the *Journal of Anatomy and Physiology*):—

1. Bregma from glabella. Average distance, $\frac{1}{5}$ of the length of the sagittal line; range of variability, $\frac{1}{2}$ an inch.

2. Apex of lambdoid suture from external occipital protuberance. Average distance, $\frac{1}{5}$ of the length of the sagittal line; range of variability, $\frac{7}{8}$ of an inch.

3. Highest level of squamous suture, taken in frontal line from pre-auricular point. Average distance, a little under $\frac{1}{3}$ of whole length of frontal line; range of variability, $\frac{3}{4}$ of an inch.

4. Temporal ridges in same line. Range of variability, 1 inch; average distance between upper and lower, about $\frac{1}{2}$ an inch.

5. Parietal eminence, occupies about mid-point of an oblique line, crossing its summit, carried from the pre-auricular point to the sagittal line. Range of variability in horizontal line, 1 inch; in vertical level, $\frac{1}{2}$ an inch.

6. Frontal eminence. Average distance from sagittal line, $\frac{1}{2}$ an inch; from upper margin of orbit, $\frac{5}{8}$ of an inch.

Both these eminences are often difficult to localise, even on the skull.

7. Mastoid process. Averages, $\frac{3}{4}$ of an inch in width, but varies considerably; the posterior margin also often, being obscured by the insertion of the sterno-mastoid muscle.

Most, if not all, of the convolutions and sulci, although sufficiently constant in character and position to permit of easy recognition, are often very capricious in their course. The fissure of Rolando, for example, with its limiting convolutions, may extend, even from end to end, without material deviation in the line from its upper and lower extremities, or it may, especially in the upper $\frac{1}{3}$, describe curves of such strength, that an inch trephine applied over the same line might

fail to expose the sulcus. The angle formed by it with the sagittal line, in eight cases (sixteen fissures), varied between 55° and 65°, except in one case, in which the right fissure measured 70° (the left 65°).

The same observation as to variability, of course, obtains equally well to the point of termination posteriorly of the fissure of Sylvius.

Mr Victor Horsley criticised the paper, and wished to know whether observations were made from hardened brains or fresh. He and Dr Beevor had shown that the fissure of Rolando had a well-marked genu, which marked an alteration in function, namely, arm above the knee and face below. The general variations were from the lower to the higher type. Messrs Anderson and Makins' observations required to be checked by Professor Cunningham's method. Diagrams were wrong as regards the precentral sulcus, even in the latest works on surgery.

Dr St John Brooks said the true key to any point in the brain was to take certain fixed points. Professor Cunningham's results coincided with Mr Hare's.

Mr C. B. Lockwood showed a cast and photographs, *vide* fig. 1, to

Fig. 1.

show an *Abnormality of the fissure of Rolando* which he had found in the brain of a subject, which had been brought in the ordinary way

for dissection. The history was unknown, but the brain, although small, was well formed, with simple but well-marked convolutions and sulci. The left hemisphere had no peculiarity, but the right fissure of Rolando was as follows (fig. 1):—It began above by opening into the great longitudinal fissure, and after descending downwards and forwards above an inch, bifurcated to inclose a long narrow convolution. The two limbs which embraced this convolution ended by opening separately into the posterior limb of the fissure of Sylvius. Mr Lockwood said he had never seen a similar abnormality; he was inclined to think that this "anomalous convolution" belonged to the parietal lobe. He had no explanation to offer to explain its occurrence.

Mr C. S. Sherrington read a paper upon the *Topography of the Pyramidal Tract*, in which he said that after section he had noticed that, in addition to ordinary degeneration in the pyramidal tract in monkeys, there was also a small peripheral degeneration near the surface of the cord, which had been found in ten cases. This tract seemed to have no special function, and seemed never to have been noticed.

Mr J. Griffiths read a paper on the *Anatomy of the Prostate Gland*, which is printed *in extenso* on p. 374 of the *Journal*. It went to show that the history of the middle lobe was in a very unsatisfactory state. Doubt was cast upon its existence. He himself had in a number of observations seen orifices in addition to the ordinary prostatic ducts further up the urethra. When these were present there was additional gland tissue in the position assigned to the third lobe. The middle lobe was sometimes pronounced, and had a partial capsule, derived from the capsule of the rest of the gland. The presence of the middle lobe was somewhat variable. The muscular fibres of the prostate was difficult to trace in adults, but easy in nine months' fœtus and earlier. The fibres were mainly circular and longitudinal, and continuous with those of the bladder.

Dr St John Brooks thought the ducts were an argument in favour of the separateness of the middle lobe. He wished to know how they developed.

Mr Mayo Collier read a paper, in which he endeavoured to disprove the existence of the three *Glosso-epiglottidian Ligaments*. Instead there is a distinct fibro-elastic membrane attached to the whole width of the hyoid bone in front, and to the epiglottis behind. Laterally its free margin runs outwards from the side of the epiglottis to line the fossa for the tonsil. The name hyo-epiglottic membrane was proposed for the middle part of this membrane, and the name amy-epiglottic fold for the tonsillar part. The central glosso-epiglottic ligament and the hyo-epiglottic ligament were not distinct structures, but constituted a single hyo-glosso-epiglottic ligament. The author had never been able to make out a continuous elastic membrane

between the thyroid cartilage and the hyoid bone. This paper was discussed by Messrs Sutton, Thane, and William Hill, who referred to the works of Landois, Hyrtl, Henle, His, and others upon the same subject.

It was announced that, owing to the number of papers sent in, an extra meeting would be held on March 6, at Guy's Hospital.

PROCEEDINGS OF THE

ANATOMICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

MARCH 1889.

An Extra Meeting of the Society was held on March 6, at Guy's Hospital, at 5 P.M. The President, G. M. Humphry, M.D., F.R.S., in the chair. Thirty-one members and visitors were present.

Alexander Macalister, F.R.S., drew attention to the desirability of a *scheme of collective investigation*, and suggested that a committee be formed to consider the question.

J. N. C. Davies-Colley proposed, and G. D. Thane seconded the proposition, that the committee of management, with the addition of Alexander Macalister, be requested to report to the next meeting upon the subject. Carried *nem. con.*

Professor Macalister next drew attention to what he considered would be a desirable amendment of the Anatomy Act, namely, that provision should be made by which unclaimed bodies should belong to the Secretary of State. This was discussed by Messrs Thane, Humphry, Davies-Colley, John Cook, and Arthur Thomson.

Professor G. B. Howes then read his paper, *Additional Notes upon the Intra-narial Epiglottis.* This paper will be found at page 587 of the *Journal of Anatomy and Physiology.*

Dr R. L. Bowles afterwards read his paper upon *The Anatomy and Development of the Palate and Epiglottis in Animals.* This paper is printed *in extenso* at page 606 of the body of the *Journal of Anatomy and Physiology.*

After quoting Youatt, who says that "in the horse the velum forms a perfect division between the mouth and the pharynx, so that, although it yields and permits the food to pass under it, in order to enter the pharynx, it prevents the return of the food, and the horse, except in the convulsive spasms of death, breathes and vomits only through the nose," Dr Bowles proceeded to point out that many animals, classed together in Natural History, have differing forms and relations in the pharynx and epiglottis.

In the full-grown pig the velum is arranged precisely like that of the horse, but the epiglottis is of a different shape, entirely surround-

ing the opening into the larynx, and lying high up in the post-narial cavity; whereas in sheep and oxen the velum is ordinarily above and behind the epiglottis, so that air may pass freely either by the buccal or nasal openings. There are also large loose arytæno-epiglottidean folds facilitating the function of rumination. In specimens of the rabbit, the guinea-pig, and the squirrel he found the velum arranged as in the horse and pig. In Professor Cleland's Museum at Glasgow he had observed that the relations of the velum of a young lion were precisely like those of the pig, whilst the relations of the velum of the puma and tiger were more like those of the sheep, and the epiglottis of the hyæna was different from either.

Dr Bowles then proceeded to demonstrate the changes which take place after birth. Firstly, in man, he showed how the epiglottis in the suckling was much curled laterally, and how this formation protected the glottis by guiding the liquid food into lateral gutters; and secondly, in the pig, the specimens of which ranged from two weeks old to six months, showing that at first the epiglottis was in the mouth, then the palate grew downwards and pressed upon and indented the epiglottis, which was now partly in the buccal and partly in the narial cavity; and finally, at six months the epiglottis shot up behind the palate high into the post-narial cavity and the palato-pharyngei muscles, uniting with those of the opposite side, form a perfect sphincter at the upper opening of the œsophagus.

Dr Bowles further stated that he had been able to confirm the views which he had expressed in his paper at the meeting of the British Medical Association in Glasgow in August last, as to the part the tongue and epiglottis bore in relation to "stertor" in animals, and to the cause of death in "mislaid" sheep.

In the discussion which ensued Messrs Bland Sutton and Macalister joined, the latter showing frozen sections of the human head to demonstrate the proximity of the epiglottis to the palate.

Dr Benjamin Howard, who criticised the existing nomenclature, said he would prefer to call the free border of the soft palate, the "meridian line." Then the intra-narial epiglottis might be called the "supra-palatal epiglottis," and the ordinary position might be called "infra-palatal epiglottis." The supra-palatal cavity and infra-palatal cavity of pharynx would be a distinction which would greatly facilitate definition. This he would explain in detail in a future paper. Supposed fatal suffocation in animals from mere supine position he did not believe in. If, in frantic struggle to rise, there was extreme head flexion, this, by pressure of descending hard palate, might force body of hyoid and base of tongue backward and downward upon epiglottis, and thus suffocation might be fatal. Mere opening or shutting of mouth had nothing to do with position of tongue. Distance from genial symphysis to body of third vertebra, point of contact of dorsum, was in either case as unchanged as distance between handle and hinges of door, whether open or shut.

He called attention to references in last number of Society's *Journal*, given by Dr Bowles, to two papers he had not published.

Mr Gordon Brodie then read the following paper on *Some Observations on the Ligaments about the Shoulder*:—

1. *Transverse-humeral*, which exists in Man as a broad strong band, trapezoid in shape, passing from the greater to the lesser tuberosities of the humerus, and so roofing in the bicipital groove and causing the tendon to play in an osseo-aponeurotic canal. It is much better marked in the fœtus than in the adult, and thicker in proportion to the relative size of the bones. Microscopy reveals in the outer wall of this canal a degenerating tract of fibro-cartilage.

It is well marked in lions, bears, tigers, and apes, though in the latter it is not limited to the bone above the epiphysial line, as it is in human specimens, both fœtal and adult.

In the Musk Ox, instead of this ligament there is a process of bone joining the summits of the two tuberosities, and thus completing a foramen—the bicipital foramen. Hence we get a complete series from the osseous tunnel of the Mole to the osseo-aponeurotic canal of Man. The lower part of the Gibbon's humerus has a well-marked fibrous septum filling in the supra-condyloid foramen, and completely separating the anterior from the posterior surfaces of the bone.

2. The *coraco-acromial* ligament always presents three portions—two strong fibrous marginal bands and a thin membranous part in the centre—which rarely has many ligamentous fibres running in it, and is almost always deficient towards the coracoid process, and through this opening the pectoralis minor passes on its way to the capsule, when it misses its insertion into the coracoid process.

3. The coraco-humeral ligament, in addition to the usual description, has an *accessory band* passing from its inner edge to the margin of the glenoid cavity, its posterior aspect thus making a Y-shaped ligament with its thicker limb attached to the greater tuberosity of the humerus.

4. In the disecting-room of the Middlesex Hospital this year there have been several instances of the tendon of the supraspinatus giving off from its anterior margin a slip which, instead of going into the capsule (as usually described), became continuous with the ascending slip from the pectoralis major, also described as passing to the capsule. In one case there was a complete separation of the muscle externally into an upper (coracoid) portion, which ended early in tendon, and a second lower (spinous) portion, which was much more muscular. One or two specimens possessed this distinct tendonous slip almost equal in size to that of the biceps tendon, and there was a partial subdivision of the muscle. A distinct bursal sac existed round the tendon in one specimen, and another had both the slip from the supraspinatus and pectoralis major anchored close together on the lesser tuberosity.

This paper was discussed by the President, G. D. Thane, and Bland Sutton.

The following were elected members of the Society:—W. E. Hoyle, Seymour Taylor, and F. G. Parsons.

MAY 1889.

A MEETING of the Society was held on May 30, 1889, at the Inns of Court Hotel, at 4.30 P.M. The President, G. M. HUMPHRY, M.D., F.R.S., in the chair. The minutes of the previous meeting were read and confirmed. The following report of the sub-committee was adopted:—1. That a committee be formed to suggest a plan by which collective anatomical investigation could be conducted, and to propose suitable subjects. 2. That the following gentlemen be asked to serve upon the committee, with power to add to their number:—Alexander Macalister, F.R.S.; John Cleland, M.D., F.R.S.; Arthur Thomson, G. B. Howes, and Peter Redfern. The following were elected members of the Society:—W. H. Haslam, H. C. de Renzi, Arthur Robinson, John W. Smith, Clement Lucas, Stanley Melsome.

Nares and Epiglottis.

Dr SYMINGTON showed a series of specimens and drawings of mesial sections of human fœtuses from the fourth to the ninth month; also similar sections in infants. The majority of the sections were made on the frozen subject, but some of the smaller fœtuses were cut with a knife after being hardened in spirit and embedded in paraffin. In a nine months' fœtus, which was frozen with the head flexed, the epiglottis projected upwards behind the soft palate. In all the other specimens there was a distinct interval between the tip of the uvula and the upper end of the epiglottis. Dr Symington stated that he had never seen an intranarial epiglottis in the human fœtus or child when the head was so placed that the face looked directly forwards. There was a very distinct interval between the epiglottis and soft palate in fœtuses of about the fourth month. This was probably partly due to the small size of the epiglottis at that age. In the frozen section of a male gorilla, about two years old, which was exhibited, the relations between the epiglottis and the soft palate were practically the same as in the human subject.

Professor G. B. HOWES said his own observations on the intranarial position of the epiglottis were made upon the Quadrumana. His information as to the human subject was given him by Mr Bland Sutton. It was not in harmony with the statements of other observers.

Mr BLAND SUTTON said he would not be responsible for the statement that the epiglottis was always intranarial in the human fœtus, although it often was in the fifth month of intrauterine life.

Elbow-Joint.

Professor CUNNINGHAM showed three models of the fully flexed elbow-joint. They represented two longitudinal sections through the joint —one through the articulation between the humerus and radius, and

the other through the articulation between the humerus and ulna. He explained that only in the case of flexed joints were models of the sectional anatomy of the limbs useful, because in other cases the specimens themselves could be preserved so easily. The tension of the parts, however, in a fully flexed joint rendered it a matter of great difficulty to preserve, after section, all the parts in their proper position, and hence the value of models prepared when the specimens are still in the frozen state.

The models which were now submitted to the Society showed a number of interesting points. Of these, he specially drew attention to the position of the bones, and the synovial pads of fat. Although in a state of full flexion, the tip of the coronoid process was separated by a considerable interval from the bottom of the coronoid fossa; so also the head of the radius is distant about a quarter of an inch from the bottom of the radial depression. Three wedge-shaped synovial pads of fat occupy the three fossæ on the lower end of the humerus.

Professor Macalister considered that the ingrowing synovial processes in the humero-radial articulation were homologous to the intra-articular fibro-cartilages of the knee.

Specimen of Abnormality of the Heart and Great Vessels.

The specimen, which was shown by Mr H. C. de Renzi, was taken from a child aged nine months. The leading features of the case are :—

1. Thickness of the muscular wall of the right ventricle as compared with that of the left;
2. The imperfect septum between the ventricles.
3. The origin of a large vessel from the right ventricle, which was continued as the descending thoracic aorta; and
4. This vessel giving off a pulmonary artery.

As to the comparative thickness of the right ventricular wall, this is doubtless to be accounted for by the greater amount of pressure which the ventricle had to overcome, and the increased amount of blood which it had to propel; at the same time, it must be remembered that although in the full-grown child and adult the wall of the left ventricle is considerably the thicker, in the fœtus, and, indeed, up to seven or eight days after birth, when obliteration of the ductus arteriosus takes place, the wall of the right ventricle is quite as thick as that of the left, a peculiarity which may be connected with the function of the right ventricle to propel the blood of the fœtus through the extended course of the ductus arteriosus, the descending aorta, and the placental circulation.

With regard to the communication between the ventricles, it will be noticed that the development of the septum has ceased at the point where it usually does in almost all cases presenting this condition, namely, close to the base of the ventricles.

Division of the arterial bulb, although arising by an independent process, does not take place until after some advance has been made in the division of the originally single ventricle; it is possible, there-

fore, that the inter-ventricular septum had not yet reached the stage when it would be necessary for the efficient working of the heart that division of the arterial bulb should take place, and thus produce a separate vessel for each ventricle.

The septum of the arterial bulb was not developed at all, and there was a persistence of the entire left 5th branchial arch.

A Rare Form of the Transversus Nuchæ.

Mr J. F. Clarke then described the above. The first regular description of this muscle is that of Schulze (Schmidt's *Jahrbuch*, B. 127, p. 288).

Schulze estimates the frequency of its occurrence at 18 out of 25 subjects. Macalister, in his "Catalogue of Muscular Anomalies," printed in the *Irish Philosophical Transactions*, gives, in Irish subjects, the frequency as 7 in 20.

The muscle arises from the superior curved line near the external occipital protuberance. The various modes of insertion are given by Macalister in the paper referred to, as follows :—

"1. Into the outer part of the superior curved line.
2. Into the posterior border of the sterno-mastoid.
3. Into the retrahens aurem, with or without an intervening tendon.
4. The muscle may be beneath the trapezius, and be inserted—
   a. With the splenius capitis.
   b. ,, splenius.
   c. ,, sterno-mastoid.
   d. ,, retrahens aurem.
5. The fibres of the muscle interlace with those of the trapezius at its occipital attachment."

The muscle is always symmetrical. In the specimen which forms the subject of the present paper, the muscles do not correspond with any of these descriptions, though this arrangement may have been noticed since the works referred to appeared.

On both sides the muscle is inserted by a broad fan-shaped group of fasciculi into the angle of the mouth. Both muscles are of a double digastric form.

On the right side the muscle arises by two heads from the ligamentum nuchæ 4 inches below the external occipital protuberance. The two heads pass to a common tendon placed over the sterno-mastoid. From this tendon two other bellies spring anteriorly, and spreading out unite, and at the angle of the mouth join the bundles of the risorius and platysma.

On the left side one of the two posterior bellies arises from the outer end of the superior curved line, the other from the ligamentum nuchæ; in other respects it resembled the muscle on the right side.

The muscle was supplied by the 7th nerve.

The muscles differ so widely from the transverse nuchæ, as it is commonly seen, that at first I thought it might be an abnormal

risorius; the latter, however, is seen well developed, and arising superficial to the anterior part of the muscle described above.

I am indebted to Dr Macalister for the references given in this paper.

Professor Charles Stewart next showed a dissected specimen of a *Cutaneous Fold from the Neck of a Goat.* The interior of the fold contained a rod of yellow elastic cartilage. He looked upon the fold as being a supernumerary auricle.

Mr Bland Sutton had also seen a cartilaginous rod in these supernumerary auricles, and also fibres of the platysma.

Mr Shattock had found a piece of similar cartilage in a supernumerary auricle from a child's neck.

Mr Arthur Thomson next read his paper on the *Influence of Posture on the Form of the Tibia in different Races of Man and the Higher Apes.* This paper is printed in full at page 616 of the body of this *Journal.*

Mr Shattock said that he and Mr Parker had described the astragaloid facet in connection with club-foot, and attributed it to flexion of the muscle.

Lumbar Curve in Spine of Gorilla.

Dr Symington showed the spine of a young gorilla to demonstrate the existence of a lumbar curve. The animal had been frozen with the thighs extended, and then cut in median sagittal section. There is both a lumbar and a dorsal curve.

Professor D'Arcy Thompson showed a number of specimens of *Fishes' Skeletons* to illustrate a cheap method of mounting them on glass.

It was announced that the next meeting would be held at Leeds, on Thursday, August 15, at 4 p.m., in the Anatomical Theatre.

After the meeting, the members of the Society entertained the President, G. M. Humphry, M.D., F.R.S., at dinner. The Chair was taken by Sir William Turner, M.B., F.R.S., and seventy-two members and visitors were present; amongst the latter were Sir James Paget, Bart., F.R.S.; Sir Joseph Lister, Bart., F.R.S.; W. S. Savory, F.R.S., President of the Royal College of Surgeons; John Marshall, F.R.S., President of the Medical Council; Professor Michael Foster, *Sec.*R.S.; R. K. Parker, F.R.S.; and W. H. Flower, C.B., F.R.S.

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PROCEEDINGS OF THE ANATOMICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

AUGUST 1889.

The Summer Meeting was held at 4.30 P.M. on August 15, in the Theatre of the Medical School, Leeds. In the absence of the President, the Chair was taken by Mr Frederick Treves. There was a good attendance of Members and Visitors.

The Secretary read Dr Ambrose Birmingham's paper entitled, *Notes on the Arrangement of the Lumbar and Sacral Nerves in a Subject with Six Lumbar Vertebræ.*

Professor Alexander Fraser of Dublin then read the following papers, of which abstracts are given below:—

1. *Photography as an Aid in Morphological Investigation.*

The author treated first of all of the difficulties under which the anatomist, histologist, or embryologist laboured in illustrating their work properly by the methods at present in use, where they had to depend either on the skill of their own pencils, or on that of the artist hired for the occasion, or on the slight aid that the camera lucida could afford them.

He had endeavoured to overcome these difficulties by adopting the photographic method, which, for the ends he had in view, fell into two divisions:—(1) For the reproduction of the several divisions of the young or adult human body, life size; and (2) for the enlargement of serial, histological, or embryological sections for purposes of reconstruction.

As regards the first end, the author detailed the manner in which he prepared the heads of the subjects examined, avoiding all solutions that were coloured, and using only a solution of corrosive sublimate; of his method of fixing them by embedding in plaster of Paris; then of the large apparatus which he employed, that had to be worked vertically, using a large rapid rectilinear lens of long focus, so as to give proper working distance to reproduce natural size and avoid all distortion. By these means he had been able to work through the head and neck from every point of view in a serial manner, reproducing every view life size. He had also been able to show the diminu-

tion in the round of the head, when it was projected on a plane surface, by employing a system of tapes placed in a fixed manner on the head. In addition, the essentials of three views, all from nature, could be shown by proper timing on one plate, the views running in this way, the skin view being a fixed one on all the plates,—skin, bone, and brain,—skin, dura, and brain,—skin, pia, and brain,—skin, external surface of brain, and central parts of same,—and so on indefinitely, in this manner making the head and neck practically transparent.

As regards the second end, a different apparatus had to be used, viz., an enlarging lantern with a rapid rectilinear lens of short focus, the oxyhydrogen light, and Morgan and Kidd's, or the Eastman sensitive bromide paper; in addition, a special carrier had to be made, into which twelve slides of the Leipzig or eighteen of the English form could be placed at one time. Each cover-glass, on a slide, with frequently as many as one hundred sections under it, required only four seconds' exposure with the full aperture of the lens; by pping the latter, changing the sensitive paper, and pushing the carrier along the breadth of a slide, the next in the series could be enlarged. And so on to the end of the twelve or eighteen slides, when the carrier could again be refilled; in this way he had enlarged the serial sections of the entire brain of an adult rodent, and the serial sections of several embryos in an evening. The ease and celerity with which this can be done, and the beauty of the enlargements, have to be seen to be appreciated.

Full details of the two applications of this method, with illustrations, will be republished shortly.

2. *On Nerve Terminations in the Thyroid Gland.*

Prof. Fraser stated that he had found bodies resembling touch corpuscles in serial sections of the thyroid gland from half-grown Cats, that these were imbedded in considerable numbers in the lymphoid tissue situated internal to the capsule of the gland on its dorsal surface.

3. *On the Pyramidal Tracts of certain Rodents.*

Prof. Fraser stated that when he first made serial sections of the entire adult brain and cord of the Rat, Mouse, and Guinea Pig, nearly three years ago, and found that in these three animals the pyramidal tracts passed into the posterior columns of the cord where they lay adjacent to the posterior commissure, and not into the lateral columns, he thought he had fallen on something new, but on looking over the literature he found that Stieda had described it in the Mouse in Bd. xix. and xx. of Siebold and v. Kölliker's *Zeitschrift;* that Flechsig had also noted it in his work, *Die Leitungsbahnen im Gehirn und Rückenmark*, Leipzig, 1876, although he considered it to be the decussation of the inter-olivary layer and not that of the true pyramidal tracts. Spitzka also, in a very able paper on "The Comparative Anatomy of the Pyramid Tract," in the *Journal of Comparative Medicine and Surgery* for January 1886, described it for the Rat, while quite re-

cently v. Lenhossék, in No. 7 of this year's (1889) *Anatomischer Anzeiger*, has again drawn attention to the fact by describing it in young Mice and Guinea Pigs, and comparing these with the position of the tracts in young Cats and Rabbits.

Finding that it had previously been described, the author had not published his observations on these three rodents until his knowledge of these tracts, and their true relations to the posterior, lateral, and anterior columns of the cord, had become more extensive by the examination of their relations in a large number of other vertebrates.

T. Wardrop Griffiths and Mr J. Oliver read their paper on the *Cutaneous Nerves of the Trunk, with special reference to Herpes Zoster*.

R. W. Reid, Lecturer on Anatomy, St Thomas's Hospital, showed the following specimens :—

1. *A Female Subject showing Cervical Ribs.*

This specimen shows the cervical vertebræ, the upper two dorsal, the first pair of ribs, part of the manubrium sterni, and *on both sides a cervical rib*.

The first ribs have their normal disposition, but each presents a prominent tubercle, situated just behind the groove for the subclavian artery. Articulating with this tubercle by a diarthrodial joint is the anterior end of the corresponding cervical rib. On the left side the cervical rib measures $1\frac{7}{8}$ inch, and on the right $2\frac{1}{8}$ inches. The heads of both cervical ribs articulate with the body of the seventh cervical vertebra, and by means of their tubercles they articulate with the transverse processes of same vertebra. The vertebral arteries entered the foramina of the fifth cervical vertebra. The brachial plexuses lay in front of the necks and under cover of the distal ends of the cervical ribs. The subclavian arteries occupied their normal positions on the first pair of ribs.

2. *Fifth Lumbar Vertebra, showing Persistence on both sides of a Suture in the Neural Arch between the Upper and Lower Articular Processes.*

This specimen belonged to a disarticulated skeleton which was in other ways normal. The sutures lie in such a position that the spinous process, laminæ, and inferior articular processes form a segment quite distinct from the rest of the bone.

The vertebra corresponds to specimens already described by W. Turner, Neugebauer, Shattock, and Sutton.

The apparently anomalous position of these sutures is explained by the mode of formation of the neural arch in some of the lower mammals, such as the Cetacea.

From the age of the subject it is impossible to say whether a neurocentral suture was present on each side in the normal position, or

whether the pedicles, transverse and superior articular processes were formed as apophyses from the centrum.

3. *Calvaria of a Tumbler, from Sir Astley Cooper's Collection in St Thomas's Hospital Museum.*

This specimen shows marked flattening of the upper surface of the cranium in the neighbourhood of the bregma. From before backwards the flattening measures about $2\frac{1}{4}$ inches, and the cranium is slightly concave in that direction. On the interior the calvaria presents a low convexity corresponding to the flattening noticed on the upper surface.

The calvaria is unusually thin, and the sutures are very well marked. A persistent frontal suture is present.

C. B. Lockwood and F. E. Withers described a specimen of *Right Aortic Arch* obtained from the dissecting-room. In this case the aorta passed at first upwards and to the right side—the ascending portion of the arch; the vessels then turned backwards and to the left, forming an arch with the concavity forwards, passing behind the trachea and œsophagus, which two structures lie in the concavity of this transverse portion of the arch; having reached the left side of the œsophagus, the aorta turns forward and so completes the concavity; here the vessel ends anteriorly in a diverticulum, which superiorly gives off the left subclavian artery; inferiorly it is connected with the pulmonary artery (at the junction of the right with the left) by the ductus arteriosus; and quite posteriorly it is continued downwards as the descending or thoracic aorta. The descending aorta starts from the transverse part of the arch almost at a right angle at the middle of the vertebral column.

The highest part of the arch ascends as high as the middle of the body of the third dorsal vertebra.

Branches.—The ascending part of the arch on its anterior aspect gives off the right and left common carotid arteries; the two vessels arise close together, almost by a common trunk (at any rate by a common opening in the aorta), the left being the lower and more anterior of the two.

The right subclavian is given off at the top of the ascending part of the arch.

The left subclavian is given off from the extremity of the transverse part of the arch, at the diverticulum.

The thoracic duct passes up on the left side of the aorta, under the extremity of the transverse arch, beneath the left subclavian artery; here it turns to the left, and crosses the vertebral artery, lying between it and its accompanying vein; the duct then crosses behind the internal jugular, and terminates by opening into the junction of the internal jugular and left subclavian veins.

In addition to these peculiarities, a suspensory ligament of the œsophagus was found, which passed from the left side of the œsophagus

just below the transverse portion of the arch of aorta, over the aorta and thoracic duct, upwards and backwards to the vertebral column, being attached to the anterior surfaces of the inferior margins of the body of the third and upper half of the body of the fourth dorsal vertebra, as well as to the intervening intervertebral disc.

The vagus of the right side passed downwards over the subclavian artery and over the aorta, as this vessel makes its first turn backwards, here it gave off its recurrent branch, which ascended in grooves between trachea and œsophagus. The main trunk of the nerve passed down behind the right bronchus.

T. Wardrop Griffiths and M. J. Oliver also showed a number of specimens from the Leeds School of Medicine, and Professor Alexander Fraser a large collection of Photographs.

PROCEEDINGS OF THE

ANATOMICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

NOVEMBER 1889.

The Annual General Meeting was held on November 27, at the London Hospital, the President in the chair. Present—Twenty-four members and visitors. The Auditor's report, showing a balance of £10, 14s. 6d. to the Society's credit, was laid on the table.

The following gentlemen were elected Officers for the ensuing year:—*President*, George Murray Humphry, M.D., F.R.S. *Vice-Presidents*, Sir William Turner, M.B., F.R.S.; Daniel John Cunningham, M.D.; George Dancer Thane. *Treasurer*, Charles Stewart. *Secretaries*, W. P. Herringham, M.D. (England); H. St John Brooks, M.D. (Ireland); John Yule Mackay, M.D. (Scotland). *Council*, Wm. Anderson; John T. Charles, M.D.; John Curnow, M.D.; J. N. C. Davies-Colley; John Cleland, M.D., F.R.S.; Rickman J. Godlee; G. B. Howes; David Hepburn, M.D.; John Langton; Charles Barrett Lockwood; Alexander Macalister, M.D., F.R.S.; A. M. Paterson, M.D.; Thomas Pickering Pick; J. Bland Sutton; John Struthers, M.D.; John Symington, M.D.; Frederick Treves; Bertram Windle, M.D.; Arthur Thomson, M.B.; Alfred H. Young, M.B.

J. Dundas Grant, M.D., was elected a member of the Society.

Dr H. St John Brooks showed models illustrating the *Topographical Anatomy of the Abdomen.*

Drs Shore and Lewis Jones showed *Sections of the Liver* in a series of vertebrates, including the Eel, Newt, Cœcilian Tortoise, Chick, and embryo Mammal, and pointed out the significant fact that in every case the liver tubules were arranged in a network. They had been unable to find any instance of a liver with tubules that did not anastomose, and from that they argued that the liver was developed from a solid mass of cells, by the entry of blood-vessels to form intertubular spaces, and that the network was not the result of an anastomosis of tubules originally separate. The special features of

the mammalian liver were that it was a tubular gland, having its network obscured by the great condensation of its tissue, and by the fineness of its meshwork; in fact, that it presented a far more intimate penetration and subdivision by blood-vessels than was to be found in the lower vertebrates.

Mr J. J. Clarke showed a Heart with *Abnormal Pulmonary Valve*, sent to him by Mr H. A. Kidd. The pulmonary valve was quadruple, each flap presenting all the characteristic parts. These cases were interesting in reference to the development of these valves in the Chick, as described by Morris Tonge in *Phil. Trans.*, 1869. The last of the three rudiments to appear is that on the outer wall of the aorta and pulmonary artery—that is, on the side of the vessel opposite the septum. This rudiment may develop into one, two, or three segments, according to the amount of space left by the other two.

Mr Thane pointed out that one of the flaps on the outer wall of the vessel was considerably smaller than the others. This fact supports the view that the additional flap has its origin in the external rudiment.

Professor Windle exhibited specimens of *Ununited Epiphyses.*

1. *Acromial.*—(*a*) Four of apical epiphyses, obtained from two subjects. The epiphysis in each case existed as a triangular fragment of bone of an average length of 2·0 cm., and breadth of 2·5 cm., forming the point of the acromion; (*b*) a pair from the same subject of bordering epiphyses which formed a narrow band, 5·0 cm. long and 1·0 to 2·0 cm. broad, fringing the whole of the end of the acromion; (*c*) a single specimen in which the epiphysis formed the greater part of the spine, being 8·5 cm. in length, the total length of the spine and acromion being 14 cm. In this case the coracoid was also separated, the epiphysis being much larger than that usually observed, the depth of the fragment being 3·0 cm. The fellow scapula had unfortunately been disposed of from the dissecting-room before the condition was noticed. It was thus impossible to say whether the conditions were bilateral. When examined, there existed between the epiphyses and body in each case what appeared to be a plate of cartilage; (*d*) two scapulæ with large irregular ended acromia, from the same subject, with small detached fragments of bone bound to each by ligament. The condition resembled that met with in chronic rheumatoid arthritis, of which, however, there was no trace in the joints. The nature of these specimens was very doubtful, possibly a partial ossification of ligament being the explanation.

2. *Of Internal Condyle.*—A humerus from which the epiphysis of the internal condyle was separated on one side only. The condyle was stunted in its growth, resembling a rounded button, and was bound by strong fibrous tissue to the lower end of the supra-condyloid ridge, which was considerably thickened.

Mr Poland maintained that the condition was due to fracture.

Professor A. M. Paterson described a case of *Fracture of Cervical Vertebræ.*

The cause of the present lesion was judicial suspension. The axis was fractured through both pedicles, causing separation of the arch from the body and odontoid process; and on the left side the transverse process was broken off. In the third vertebra the transverse process was fractured on the right side, and incompletely on the left also.

The following was the condition of the parts after death:—(1) separation of the body of the axis from that of the third vertebra, with adherence of the intervertebral substance to the former, and rupture of the anterior and posterior common ligaments; (2) rupture of the posterior atlanto-axial ligament, with adherence of the arch of the axis to that of the 3rd vertebra; (3) rupture of the soft structures connecting the transverse processes of the 2nd and 3rd vertebræ together, including the vertebral artery; (4) rupture of the spinal membranes and cord, opposite the interval between the 2nd and 3rd vertebræ, and laceration of the roots of the 2nd cervical nerves.

In relation to this specimen, it is worthy of note, that the intervertebral disc between the 2nd and 3rd cervical vertebræ lies at the level of the chin when slightly raised, and that the parts above that—the atlas, body, and odontoid process of the axils—retained their normal relations after death. The odontoid process still remained within the transverse ligament. The immediate cause of death was rupture of the spinal cord, which would occur, *pari passu*, with the fracture of the vertebræ. The force exerted to produce the lesions may be roughly estimated at 1 ton 8 cwt., as the weight was $10\frac{1}{2}$ st., the length of drop $6\frac{1}{2}$ feet.

The following paper by Dr Berthold Beer of Vienna, *on the Development of the Sylvian Fissure in the Human Embryo*, was then read.

The development of the persistent convolutions and fissures of the hemispheres is preceded by the appearance of *primitive convolutions*, as they are called by Koelliker, which have been already described by Tiedemann, F. Schmidt, and A. Ecker. They may be seen already in a fœtus of the third month, and disappear in the fifth month, when the lateral surface of the hemispheres becomes smooth again. These primitive convolutions are not artificial products produced by the action of hardening solutions, as has been supposed by Bischoff, but they are produced by folding of the thin hemisphere, due to compression by the enveloping meningeal membranes. There are folds projecting into the cavity of the hemisphere which correspond to the fissures of the outer surface, as I could state in the cerebrum of a human fœtus of the twelfth week, examined three hours *post-partum* in a perfectly fresh state. The number of the primitive fissures being

three or four on the lateral surface of the hemisphere in the third month, is increased in the fourth month as may be seen by the drawing (fig. 1, *P.S.*), and their situation is also altered by the growth of the brain. In the third month, they show a radiating arrangement converging downwards to the angle where the frontal and temporal ends of the hemisphere are lying close together, while in the fourth month only traces of this radiation could be observed. It may also be

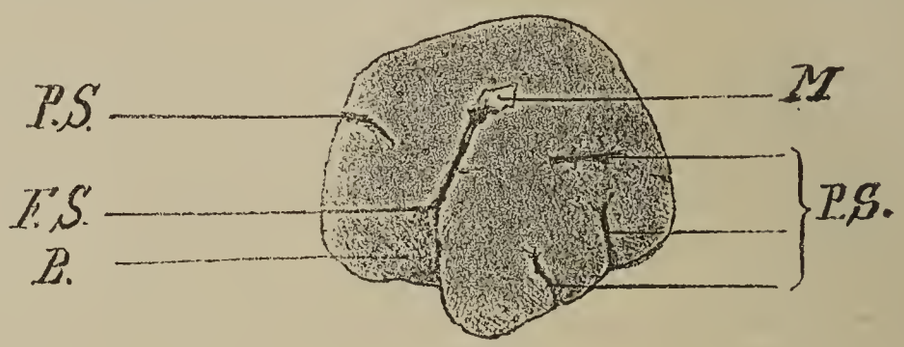


Fig. 1.

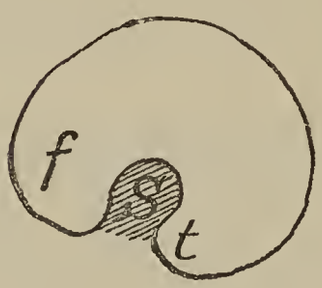


Fig. 2.

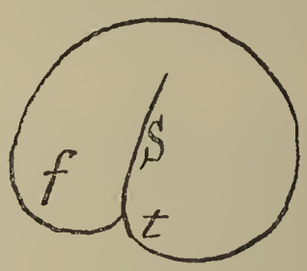


Fig. 3.

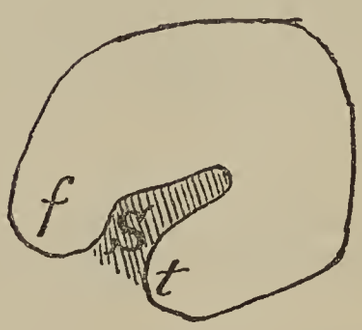


Fig. 4.

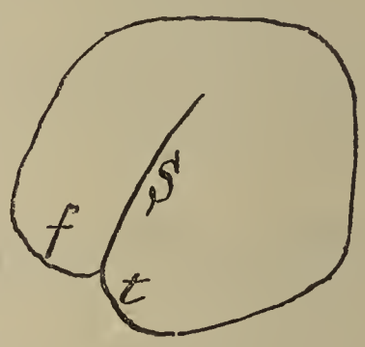


Fig. 5.

Fig. 1.—Lateral Surface of the Left Hemisphere of a Human Fœtus (12–14 weeks old). *P.S.*, primitive fissures ; *F.S.*, Sylvian fissure ; *B.*, basal surface ; *M*, part of meningeal membrane filling the Sylvian fissure.

Figs. 2, 3, 4, 5.—Schematic Diagrams of the Left Hemisphere. *f*, frontal lobe; *t*, temporal lobe.

Figs. 2, 4.—After *Ecker*. *S*, Sylvian groove with the floor (*Insula Reili*).

Figs. 3, 5.—Original. After removal of meninges. *S*, Sylvian fissure.

stated, that even in the same brain the development of the primitive fissures shows inequalities, and frequently the left hemisphere shows a higher development of the fissures than the right. Besides the primitive fissures, I had opportunity to see on the hemispheres of the fourth month a system of very small gyri and sulci, resembling the convolutions of the adult brain on a diminished scale. These small gyri are especially well developed in the occipital part of the hemi-

sphere, and are due to inequalities in the histological development of the wall of the hemisphere. They have not been described till now, and should not be confounded with the shagreen-like appearance of the surface of fœtal brains produced by the action of hardening agents. The *microgyri*, just described, I could see in an embryo of the fourth month, examined an hour *post-partum*, shining through the transparent meningeal membranes. The primitive fissures disappear, as is well known, in the fifth month, with the exception of the Sylvian fissure on the lateral surface, and of the sulcus hippocampi and sulcus parieto-occipitalis on the median surface. According to Ecker, Mihalkovics, &c., the Sylvian fissure of the adult is formed by the gradual narrowing of a flat, broad depression on the lateral surface of the hemisphere, which is due to arrest of development of the insula Reili in the third month of fœtal life. Ecker arrived at this conclusion by observations made on fœtal brains hardened by chloride of zinc injections. On fœtal brains of the third and fourth month, examined by me in a perfectly fresh state a few hours *post-partum*, I could also see the grooves described by Ecker as long as the brain was covered by the meningeal membranes, *but as soon as the meninges were removed*, it could be seen that the hemisphere on its lateral surface was divided into two lobes (*f*, *t*, figs. 3, 5), by a *long* and *deep fissure* (fig. 1, *F.S.*; figs. 3, 5, *S.*), running in a nearly vertical direction to the base, and the groove-like appearance had only been produced by the mycomatous tissue surrounding the cortical blood-vessels covering the angle, where the frontal and temporal ends (figs. 3, 5, *t.*), are touching each other. The relation of the different parts will be easily understood by perusal of the accompanied figures. The insula Reili is not marked out in the fœtus of third or fourth month on the lateral surface of the hemisphere, but at the end of the fifth month, by the formation of short fissures lying in the frontal lobe and directing its concavity to the neighbouring Sylvian fissure, the Sylvian groove is formed, which becomes closed later by the intensive growth of the operculum.

A full description of the morphological and histological development of the fœtal hemisphere will soon be published.

Professor Cunningham read the paper upon the *Intraparietal Fissure of the Human Brain*, which is printed *in extenso* in the *Journal of Anatomy and Physiology*, p. 135.

The following paper was read at the August Meeting of the Society; its publication has been unavoidably postponed until now:—*On the Distribution of the Cutaneous Nerves of the Trunk, with special reference to Herpes zoster*, by Professsor Wardrop Griffith and Dr Oliver.

For some years one of the writers (Dr Griffith) had had a difficulty in reconciling the distribution of the cutaneous affection in herpes zoster with the ordinarily accepted views of the distribution of the cutaneous nerves.

The descriptions in all the text-books were based on Hirschfeld's diagrams, and a consideration of these would lead one to expect that if the posterior group of vesicles of a case of herpes zoster occupied an area corresponding say to the 11th or 12th dorsal spines behind, its anterior group would occupy an area below the level of the umbilicus; and, on the other hand, that in a case with the anterior group at the epigastric region, the posterior group would be about the mid-dorsal region.

That this was not the case was shown by a series of charts he had made, which all agreed in demonstrating that the posterior group of vesicles was always much lower with reference to the anterior than would be expected. This was especially noticeable when the disease affected the lower part of the chest.

He had also noticed, as bearing on this point, that the upper limit of the anæsthesia in cases of paraplegia was transverse, or almost so, corresponding in fact with the line of herpes, and not oblique, as would be expected from the accepted anatomy.

A series of dissections had been undertaken by the writers, and the following was a summary of their results:—

1. The distribution of the anterior primary divisions of the intercostal nerves, as given by Hirschfeld, is accurate, and is strictly followed by the cutaneous distribution of herpes.

2. The posterior primary divisions of the intercostal nerves pass very obliquely downwards, and are distributed to the skin several inches—in some cases as many as six—below their origin. Thus in one case it was found that the skin over the 12th dorsal spine was supplied by the 6th nerve. As a rule, the posterior primary division of the nerve was distributed as far down or further than the anterior branch.

3. This downward sweep of the nerves takes place mainly in their intra- and inter-muscular course. The only mention of the downward course of the nerves in any of the books is contained in Cruveilhier's *Descriptive Anatomy*, vol. i., 1848, p. 1037. He describes with great accuracy the posterior primary division of the 9th, 10th, 11th, and 12th dorsal nerves as passing down between the longissimus dorsi and iliocostalis, but does not mention any obliquity in common with any of the others.

4. The passage of posterior primary divisions of lower dorsal nerves as cutaneous filaments to the buttock—described by Cruveilhier, but not mentioned in any other work—was confirmed as a frequent occurrence, and the opinion expressed that these nerves were frequently demonstrated to students as coming from lumbar nerves only.

5. Great variety existed in the distribution of the posterior primary divisions of the nerves, and they differed much on the two sides of the body. Frequently both the internal and the external divisions gave cutaneous branches.

12

REPORT

OF THE

COMMITTEE OF COLLECTIVE INVESTIGATION OF THE ANATOMICAL SOCIETY

OF

GREAT BRITAIN AND IRELAND.

REPORT OF THE COMMITTEE OF COLLECTIVE INVESTIGATION OF THE ANATOMICAL SOCIETY OF GREAT BRITAIN AND IRELAND FOR THE YEAR 1889–90. Reported by Arthur Thomson, M.A., M.B., *Lecturer on Anatomy, University of Oxford.*

In presenting this, the First Annual Report, it may be well to call attention to the steps that have been already taken to further Collective Investigation among the anatomical teachers of this country.

At a meeting of the Anatomical Society, held on March 6, 1889, it was agreed to appoint a Committee to consider a scheme of Collective Investigation.

In the month of September of the same year, this Committee issued the following questions:—

1. Abnormalities in the arterial supply of the kidney. The renal arteries to be noted in every subject dissected, and all deviations from the normal arrangement in number and position to be tabulated.
2. The relation of the internal maxillary artery to the external pterygoid muscle, whether superficial to, or deeper than the muscle, its position to be noted in each body.
3. The condition of the tuberculum laterale of the posterior process of the astragalus, whether detached as an os trigonum, or continuously ossified to the astragalus, its relations to the posterior astragalo-peroneal ligament may also be noticed.
4. The order of union of the three great trunks which form the vena portæ, and the levels of their junctions. The recorder is asked to endeavour, as far as possible, to observe and report the existence of valves in any of the tributaries of this vein.

Copies of the above were forwarded to the teachers in the following schools:—

*St Bartholomew's Hospital, London.
Charing Cross Hospital, London.
St George's Hospital, London.
Guy's Hospital, London.
King's College, London.
London Hospital, London.
St Mary's Hospital, London.
*Middlesex Hospital, London.
*St Thomas' Hospital, London.
*University College, London.
*Westminster Hospital, London.
London School of Medicine for Women.
Cook's School of Anatomy.
*University of Oxford.
*University of Cambridge.
*Queen's College, Birmingham.
Bristol Medical School, Bristol.
*School of Medicine, Yorkshire College, Leeds.
*School of Medicine, University College, Liverpool.
The Owens College, Manchester.
*University of Durham, School of Medicine, Newcastle-on-Tyne.
University of Edinburgh.
School of Medicine, Royal College of Surgeons, Edinburgh.
School of Medicine, Minto House, Edinburgh.
*University of Aberdeen.
University of Glasgow.
Anderson College, Glasgow.
St Mungo's College, Glasgow.
Western Medical School, Glasgow.
*School of Physic, Trinity College, Dublin.
Carmichael School of Medicine, Dublin.
Catholic University, School of Medicine, Dublin.
Royal College of Surgeons, Ireland.
Queen's College, Belfast.
Queen's College, Cork.
Queen's College, Galway.

Through error, notices were not sent either to University College, Dundee, or to the School of Medicine for Women, Edinburgh.

Answers were received from 13 of the 36 schools enumerated above, a fact which is noted by placing an asterisk before the name of the institution from which an answer has been received.

Whilst the Committee is gratified with the support they have received, they cannot but recognise the fact that many of the larger and more important educational bodies are conspicuous by their absence in the Report. The Secretary intimates that in several instances where the notices had been forwarded to the professors or teachers, these officers had not brought them under the notice of the gentlemen more immediately engaged in the direction of the practical work. As it is impossible in all cases to obtain accurate information as to the proper person to whom to address the notices, the Committee express the hope that in future the officials who receive the Society's notices will undertake to forward them to the proper quarter. Had such been done in the present instance, the Secretary has reason to know that the number of reports sent in would have been considerably greater. In view of facilitating the arrangements, the Secretary will be glad to receive any information as to the proper persons to whom to address the notices. Encouraged by the success of the present inquiry, the Committee, profiting by the experience of the past year, trust that next year they may look forward to receive the co-operation of a larger number of schools in the publication of their Report. Meanwhile, they wish to

place on record their thanks to the gentlemen who have so kindly assisted them upon the present occasion.

REPORT.

In dealing with the answers to the various questions, the Secretary has endeavoured, as far as possible, to arrange the results in tabular form. This has not always been an easy matter, hence the necessity of occasional notes in the Tables.

Prefixed to each Table is a paragraph explanatory of its arrangement, together with a summary of facts, the nature of which precludes the possibility of arranging them in tabular form.

Question 1.—Table I.

Nine reports have been sent in, in reply to Question 1, giving a total of 419 arteries examined.

The first column contains the names of the schools from which the reports have been received. Appended to each School is the name of the gentleman to whom the Society is indebted for their return. The succeeding eight columns are devoted to the enumeration of the different varieties recorded, each column being further subdivided into three for right and left sides and total respectively. When the figures in the R. and L. columns are linked together, thus (10—10), it implies that the arrangement is the same on both sides; when not so joined, it indicates that the arteries on the two sides of the same subject have differed. The last column on the right hand side of the table contains the totals of the different specimens examined in each school.

Mr C. Angus, in the Aberdeen report, cites a case in which the right renal artery gives off muscular branches to the right crus of the diaphragm. Referring to the case of three renal arteries on both sides in the same report, Mr Angus writes—"The left is supplied by three arteries coming off separately from aorta. The upper (much the larger) arose 1″ below the cœliac axis, the lower one $\frac{1}{2}$″ below this point. Right supplied by three from aorta, all arising close together, middle the larger."

In the Trinity College, Dublin, report, forwarded by Professor Cunningham, in the cases recorded in columns 3, 4, and 5, the accessory arteries entered the kidney at the upper and lower borders of the organ, in column 6 the arteries enumerated entered the hilum.

Quoting from the same report, the following is interesting:—

"In regard to the relations of the artery, vein, and ureter, the varieties were arranged into six classes for convenience.

"*Class* 1. In this the arterial trunk arising from the aorta passed

outwards behind the vein, its branches entering the hilum between the vein and ureter. Of this variety, fifty-two instances were noted.

"*Class* 2. In which the trunk of the artery passing outwards behind the vein broke up into branches, which enclosed the ureter at the hilum. This condition existed in twenty-one cases.

"*Class* 3. In this the artery passed out behind the vein, but its terminal branches in entering the hilum enclosed that vessel. Of this variety, twelve instances were noted.

"*Class* 4. In which the course of the artery lay behind the vein, but its terminal branches enclosed both the vein and ureter at the hilum. Eight cases fell into this category, in five of which there was also a branch entering between the vein and ureter.

"*Class* 5. In which the artery coursed outwards altogether in front of the vein, its branches retaining the same position at the hilum. Eight cases of this variety were also noted.

"*Class* 6. In which the artery passed outwards behind the vein, but its branches entered the hilum altogether behind the ureter. Only two instances were noted."

Mr H. D. Rolleston, in the St Bartholomew's Hospital return, notes the fact that in seven subjects the arterial supply was normal on the right side, whilst on the left, two renals were present. In the subject with the three renals on the right side, there were two renals on the left, and in that with four arteries on the left, there were two on the right side.

In the report forwarded from University College, London, by Professor Thane, Mr E. W. Selby describes a case in which "the right kidney was large, and was supplied by a single artery; the left kidney was very small, crescentic in shape, and each extremity received a small vessel, the upper arising from the back of the aorta opposite the renal artery, the lower from the front of the aorta $\frac{1}{2}$ an inch above its bifurcation." In the instance recorded in this report of the occurrence of three arteries on the left side, there was but one on the right side.

Mr F. G. Parsons, F.R.C.S., in the St Thomas' Hospital report, summarizes the details as follows:—"Out of thirty bodies examined, nine displayed abnormalities in the arterial supply of the kidneys. In six subjects the arteries were abnormal on one side only; of these three were on the right and three on the left. In the other three cases, both sides were abnormal. Mr Parsons also draws attention to the fact that in four cases in which an accessory renal artery comes from above the proper renal, the accessory trunk crosses obliquely in front of the renal artery, and enters the lower part of the organ just below the hilum; in two instances it supplies offsets to the ureter."

One of the cases noted in this report is interesting. It is described as follows:—"Movable kidney on the right, having three renal arteries, one from the aorta and one from each common iliac."

In one of the diagrams with which Mr Parsons illustrates his report, the ureter is represented as double for a considerable distance on the right side.

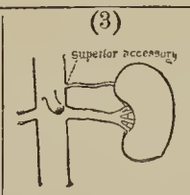
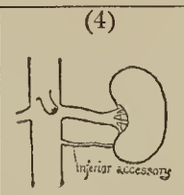
Mr W. Thelwall Thomas, F.R.C.S., notes the following in the

report from University College, Liverpool:—"Right kidney three arteries, the uppermost corresponding to the normal position, the lowest being $\frac{1}{2}$ an inch from the bifurcation. The ureter *is in front*, the vena cava *behind*.

In a report received from Queen's College, Birmingham, mention is made of two cases of double renals in different subjects. In one, on the left side, the arteries arose from the aorta 10 mm. and 8·5 mm. respectively above the bifurcation. In another subject there were two renal arteries on the right side. These cases are not included in the Tables, as unfortunately there was no record sent of the number examined.

[Table I.

TABLE I.—*Abnormalities in the Arterial Supply of the Kidney. The Renal Arteries to be Noted in every Subject dissected, and all Deviations from the Normal Arrangement in Number and Position to be Tabulated.*

Reports.	(1) Normal.			(2) Single Artery undergoing immediate division.			(3) 			(4) 			(5)			(6) Two Arteries not specified.			(7) Three Arteries.			(8) Four Arteries.			(9) Total number examined.
	R.	L.	Total.	R.	L.	Total.	R.	L.	Total.	R.	L.	Total.	R.	L.	Total.	R.	L.	Total.	R.	L.	Total.	R.	L.	Total.	
Cambridge University— W. C Melsome,	10–7	10–5	32	2 dividing into 2, 1 into 3.	1 dividing into 2.	4	1	3	4	1	3	4	.	.	.	1	2	3	1	2	3	1	.	1	51
Oxford University,	2–.	2–2	6	1	1	2	2	.	2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	10
Aberdeen University— C. Angus, M.B.,	10	10	20	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	1	1	2	.	.	.	22
Trinity College, Dublin— A. C. O'Sullivan, F.T.C.D. O. L. Robinson, M.R.C.S., L.R.C.P.	.	.	76	.	.	.	.	.	10	.	.	4	.	.	1	.	.	8	.	.	3	.	.	1	103
St Bartholomew's Hospital, London— H. D. Rolleston,	12–7	12–3	34	.	.	.	.	.	3	.	.	3	.	.	.	4	9	13	1	.	1	.	1	1	55
University College, London— E. W. Selby,	9–4	9–.	22	.	.	.	1	1	2	.	2	2	.	.	.	.	1	1	.	1	1	.	.	.	28
St Thomas's Hospital, London— F. G. Parsons, F.R.C.S.,	.	.	48	.	.	.	2–3		7	1	1	2	2	.	2	.	.	.	1	.	1	.	.	.	60
Middlesex Hospital, London— C. Gordon Brodie, F.R.C.S.,	8–1	8–4	21	2 splitting into 2.	.	2	.	.	.	.	.	.	1	.	1	1–3	1 1 1 accessory from inf. mesenteric.	7	. 1 2 branches from aorta, 1 from inf. mesenteric.		1	.	.	.	32
University College, Liverpool— W. Thelwall Thomas, F.R.C.S.,	.	.	53	.	.	.	.	1	1	1	1	2	.	.	.	.	.	.	2	.	2	.		.	58
Total,	.	.	312	.	.	8	.	.	29	.	.	17	.	.	4	.	.	32	.	.	14	.	.	3	
Percentage,	.	.	74·4	.	.	1·9	.	.	6·9	.	.	4	.	.	9	.	.	7·6	.	.	3·3	.	.	·7	

Question 2.—Table II.

Answers to Question 2 have been received from thirteen schools, comprising in all 447 observations.

The division A in the Table includes a record of all the arteries examined. The first column includes the total number examined in each report, the two succeeding columns being devoted to those cases in which the artery is superficial, or deep, as the case may be. Each column is further subdivided so as to allow of the grouping of the cases into left and right, the total in each case being given in larger figures. Division B includes those cases only which were examined on both sides. The figures here refer to the number of subjects examined, *not to the arteries.* This is further subdivided into columns, in which are noted the totals, the numbers of those superficial and deep on both sides, and the instances in which there is a variation in the arrangement of the artery on the different sides. Unfortunately the data forwarded are not in all cases sufficient to yield a complete return, but it has been thought well to tabulate such facts as have been stated. The last division has been devoted to "remarks." These chiefly refer to the relations of the artery to the various nerves in this region.

In the Trinity College report, Mr J. J. Long cites two cases in which the artery pierced the lower head of the muscle, and then became superficial to it, thus pursuing an intermediate course. In another case the artery pursued a very irregular course. It first passed deeper than the muscle, piercing the inferior dental nerve; it then coursed upwards, appeared above the superior head of origin of the pterygoid, whence it curved downwards and forwards, passing between the two heads of the muscle to enter the spheno-maxillary fossa.

[Table II.

TABLE II.—*The Relation of the Internal Maxillary Artery to the External Pterygoid Muscle, whether superficial to, or deeper than, the Muscle, its Position to be noted in each Body.*

Reports.	A. Includes all Arteries examined.						B. Includes only those examined on both sides.				
	Total.	Artery superficial to muscle.			Artery deeper than muscle.			Total.	Superficial.	Deep.	Different on two sides.	
		R.	L.	Total.	R.	L.	Total.					
University of Cambridge— W. C. Melsome, ...	51	17	17	34	9	7	16	.	11	3	.	In one case the artery pierced the lower origin of the external pterygoid.
University of Oxford— H. A. Munro, B.A., ...	20	3	6	9	4	7	11	.	2	2	.	In one subject the artery on the right side lay between the inferior dental nerve and the lingual nerve; on the left side, it lay in front of both nerves. In both instances the artery lay behind the external pterygoid. In another subject, the artery, which was deep, had the lingual and inferior dental nerves behind it, and the buccal nerve in front.
University of Durham, College of Medicine, Newcastle-on-Tyne— Dr Howden, ...	16	7	6	13	1	2	3	.	4	.	3	
University of Aberdeen— C. Angus, M.B., ...	34	5	5	10	12	12	24	.	5	12	.	In no case recorded is there any difference between the two sides.
Trinity College, Dublin— J. J. Long, B.A. (Dubl.), . .	93	23	24	47	25	18	43	42	.	.	.	When the artery was superficial to the muscle, the long buccal nerve, which invariably came through the interval between the heads of the external pterygoid, passed superficial to and above the artery in thirteen cases; below and deeper than the artery in thirty-four cases. When the artery was deeper than the muscle, the long buccal nerve was always above the artery. The inferior dental nerve was superficial to artery in nineteen instances. The inferior dental nerve was deeper in nineteen instances. The inferior dental nerve was perforated by artery, in five instances. Lingual nerve superficial to artery in seven instances (in which cases the inferior dental was also superficial). Lingual nerve deeper than artery in thirty-six instances.
Carry forward, . . .	214	.	.	113	.	.	97	.	.	.	.	

TABLE II.—*continued.*

Reports.	A. Includes all Arteries examined.							B. Includes those only examined on both sides.				Remarks.
	Total.	Artery superficial to muscle.			Artery deeper than muscle.			Total.	Superficial.	Deep.	Different on two sides.	
		R.	L.	Total.	R.	L.	Total.					
Brought forward, .	214	.	.	113	.	.	97					
St Bartholomew's Hospital, London— H. D. Rolleston, ...	38	10	5	15	11	12	23	10	2	7	1	
University College, London— H. A. Ballance, ...	36	9	4	13	15	8	23	12	3	6	3	
St Thomas's Hospital, London— F. G. Parsons, F.R.C.S., . .	30	6	8	14	9	7	16	.	5	6	4	
Middlesex Hospital, London— C. Gordon Brodie, F.R.C.S., .	30	4	5	9	11	10	21	.	3	9	3	All the subjects were males, with one exception, in which case the artery lay deeper than the muscle on both sides.
Westminster Hospital, London— Dr James Black, ...	.	.	.	.	.	.	.	.	.	.	.	The internal maxillary has been seen to pass in about an equal number of cases over and under the external pterygoid muscle. Thrice I have noticed the artery not only beneath the muscle mentioned, but also that it coursed forward *beneath* the gustatory and inferior dental nerves.
University College, Liverpool— W. Thelwall Thomas, F.R.C.S., .	60	.	.	55	.	.	5	.	.	2	.	
Yorkshire College, Leeds— W. J. Oliver, ...	32	9	9	18	7	7	14	.	8	6	1	Of those cases in which the artery passed under the muscle, it was noted that in four instances it passed in front of the branches of the 5th nerve; in one it passed behind the inferior dental nerve and lingual nerve; in three it passed over the lingual and under the inferior dental nerve.
Queen's College, Birmingham— Dr A. E. Mahood, . . .	7	.	.	6	.	.	1	.	.	.	.	In the case where the artery was deep it lay between the inferior dental and lingual nerves.
Total, ...	**447**	.	.	**243**	.	.	**200**	.	.	.	.	
Percentage, . . .	**100**	.	.	**54·3**	.	.	**44·7**	.	.	.	.	

QUESTION 3.—TABLE III.

Ten replies in all were received, making a total of 438 specimens examined. The arrangement of the Table requires no explanation. Any observations by the different reporters are to be found in the column of "remarks."

TABLE III.—*The condition of the Tuberculum laterale of the posterior process of the Astragalus, whether detached as an os trigonum, or continuously ossified to the Astragalus; its relations to the posterior Astragalo-peroneal ligament may also be noticed.*

Reports.	Total Number of Specimens Examined.	Evidence of Separate Centre of Ossification.	Os Trigonum Separate and Distinct.	Remarks.
University of Cambridge— W. C. Melsome,	28	.	4	Two detached on same subject. The others right and left in different subjects.
University of Oxford,	14	1	.	In two cases the tuberculum laterale was of unusual size.
University of Durham, College of Medicine, Newcastle— Dr Howden,	8	.	.	
University of Aberdeen— C. Angus, M.B.,	34	.	.	In one case the posterior fasciculus of the external lateral ligament of the ankle was not connected with the tuberculum laterale.
Trinity College, Dublin— C. E. Stokes, B.A.,	108	1	3	In each case of the occurrence of an os trigonum, there was a distinct synovial joint, which communicated with the cavity of the posterior astragalo-calcaneal articulation: in each case the ossicle was connected by a small slip with the posterior fasciculus of the external lateral ligament of the ankle.
University College, London— Percy Fleming, M.D., F.R.C.S.,	50 (Adults.)	.	1	The ossicle was united to the astragalus by fibrous tissue, the union allowing of slight movement. The ossicle was connected with the posterior fasciculus of the external lateral ligament of the ankle.
	16 (Under 12 months.)	.	.	
	4 (12–24 months.)	.	.	
St Thomas's Hospital, London— F. G. Parsons, F.R.C.S.,	60	.	.	
Middlesex Hospital, London— C. Gordon Brodie, F.R.C.S.,	32	2	.	In the two cases recorded there was evidence of a suture, but the bones were firmly united. In one case the tuberculum laterale was large.
Queen's College, Birmingham— Dr A. E. Mahood,	46	2	3	In no case was it possible to demonstrate a synovial cavity. The posterior fasciculus of the external lateral ligament was attached to the os trigonum, some fibres being continued into the astragalus.
Yorkshire College, Leeds— M. J. Oliver,	38	.	1	The separate ossicle was firmly united to the astragalus by fibrous tissue.
Total,	**438**	**6**	**12**	
Percentage,	**100**	**1·3**	**2·7**	

Question 4.—Table IV.

From the nature of the inquiry, the returns in this case are not so numerous. Seven schools only have sent in reports, with a total of 118 cases examined.

The first four columns in the Table explain themselves. The fifth is devoted to a tabular view of the point of formation of the portal vein. This column has been subdivided into four wide spaces and three narrow spaces. The wide spaces represent the vertebræ from the 12th dorsal to the 3rd lumbar, the intervening narrow spaces, the intervertebral discs. The figures (which indicate the number of cases noted) are placed in these wide and narrow columns according as the point of formation of the portal vein corresponds to the level of a vertebra or a disc, the vertebræ in each case being numbered at the upper end of the column. When the figures are placed more to the right or left sides of the wide columns, it implies that the point of formation of the vein lay more to the lower or upper border of the vertebra respectively.

Mr W. C. Melsome, in the Cambridge return, notes the fact that in nine cases the inferior mesenteric joined the superior mesenteric about an inch below and to the right of the superior mesenteric artery and opposite the 2nd lumbar vertebra.

In the Durham report, there is no record of any valves being found, though sought for in each instance.

In the Trinity College report, the following facts are worthy of quotation :—

"With regard to the exact point at which the veins united, it was found that the *inferior mesenteric* vein entered the *splenic vein* in 19 cases between $\frac{1}{2}$ and $\frac{3}{4}$ of an inch from its termination, in 10 cases about an inch, and in 4 cases at $\frac{1}{4}$ of an inch or under, from its termination, three of these were at the angle. When the *inferior mesenteric* joined the *superior mesenteric*, it did so in 11 cases about $\frac{1}{2}$ an inch, in 8 cases about $\frac{1}{4}$ of an inch, and in 3 cases over $\frac{1}{2}$ an inch from its termination."

In all cases the portal vein was formed behind the head of the pancreas.

Professor Cunningham appends some notes on observations concerning the mode of termination of the superior gastric or coronary vein.

Forty-eight subjects were examined with this object; 22 were males, and 26 were females.

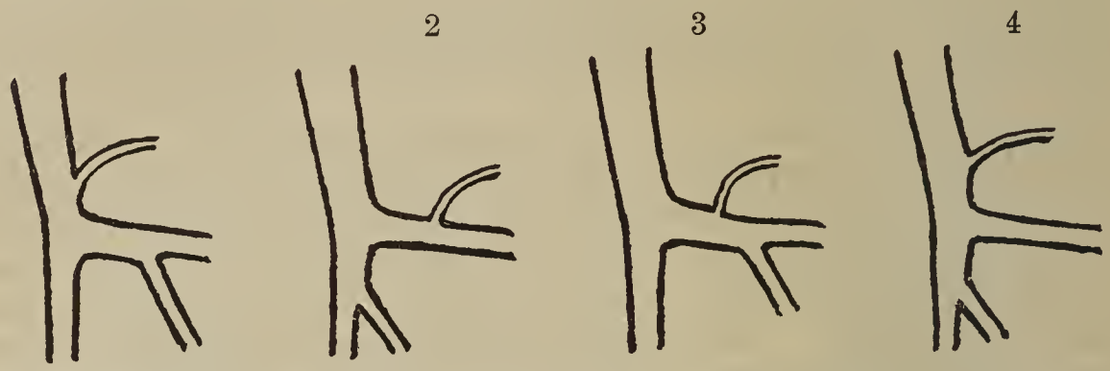
The manner of ending was as follows :—

(*a*) *In the Portal Vein.*—This occurred in 29 subjects; 15 of these were males, 14 were females.

(*b*) *In the Splenic.*—This obtained in 19 subjects; 12 females, 7 males.

In 47 of these cases the termination of the inferior mesenteric vein had also been observed, which, taken with the above, brought out the fact that there were four chief ways in which the portal vein may be formed (Diagram, page 100).

1. The most frequent method is that which is described as normal, —where the inferior mesenteric vein enters the splenic, while the



superior gastric enters the portal vein. This condition existed in 18 out of the 47 subjects—9 males and 9 females.

2. The next most frequent mode is that which may be called the reverse of the first, where the inferior mesenteric vein joins the superior, while the superior gastric enters the portal (splenic ?). This occurred in 11 of the subjects—9 females and 2 males.

3. In this mode of formation, both the inferior mesenteric and superior gastric veins poured their blood into the splenic. In 8 subjects this condition existed, 4 being males and 4 females.

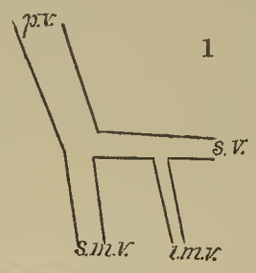
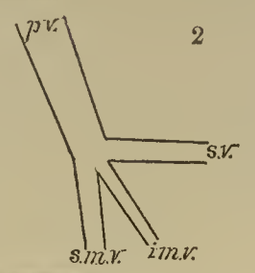
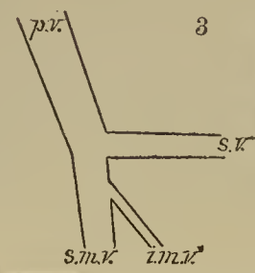
4. Here, neither the inferior mesenteric nor gastric veins entered the splenic, but both these, together with the splenic vein, successively joined the continuous trunk of the superior mesenteric and portal veins. This obtained in 7 subjects—3 males and 4 females.

As noted in the Table, Mr Bunch, in the University College, London, reports, records the fact that out of 14 cases examined, the coronary (superior gastric) joined the portal in 11 instances—in 3 subjects the coronary vein joined the splenic.

It has been decided not to attempt to analyse the results, or compare them with previous observations. The Committee, being of opinion that this may best be left to those interested in such work, content themselves with publishing what they have reason to believe is a valuable series of reliable statistics.

In conclusion, the Secretary regrets that he has not received many suggestions for the inquiry for the ensuing year. Any communications regarding this or other business of the Committee of Collective Investigation should be addressed to him, at the Museum, Oxford.

TABLE IV.—*The Order of Union of the three Great Trunks which form the Vena Portæ, and the levels of their junctions. The recorder is asked to endeavour, as far as possible, to observe and report the existence of valves in any of the tributaries of this vein.*

Reports.	Total Number Examined.				Point of Formation of Portal Vein.							Remarks.
					Vertebræ.							
					Dorsal.	Lumbar.						
					XII.	Disc.	I.	Disc.	II.	Disc.	III.	
University of Cambridge— W. C. Melsome, . .	21	11	1	9	.	.	.	.	.	.	.	
University of Oxford—	4	4	.	.	.	.	.	.	(2.)	.	.	No valves; in two cases the coronary vein joins the portal.
University of Durham, Coll. of Medicine, Newcastle— Dr Howden, . . .	5	5	.	.	.	(1.)	(1.)(1.)	(2.)	.	.	.	
University of Aberdeen— C. Angus, M.B., . .	8	4 The inferior mesenteric joins the splenic at points varying from ½″ to 3½″ to left of point of formation of portal vein.	.	4 Inferior mesenteric joins superior mesenteric from 1″ to 3″ below point of formation of portal vein.	(7.)	(1.)	.	.	.	.	.	No valves observed.
Trinity College, Dublin— W. Henry Thomson, M.D. (R.U.I.), M.R.C.S.,	58	33 (Males, 19; Fem., 14).	3	22 (Males, 4; Fem., 18).	.	.	(4.)	(4.)	(33.)	(5.)	(1.)	Eighteen were examined for valves; none found.
University College, London— F. Bunch, . . .	14	9	2	3	.	.	.	.	.	.	.	Coronary vein joins portal in 11 instances.
Middlesex Hospital, London— C. G. Brodie, F.R.C.S.,	8	5	2	1	Apposite head of Pancreas, ... 3 Apposite upper border of body of Pancreas . 2 Behind body of Pancreas, ... 2 Lower border of body of Pancreas, . . . 1							Coronary vein joins splenic in 3 instances.
Total, . . .	118	71	8	39	(7.)	(2.)	(1.)(1.)(4.)	(6.)	(35.)	(5.)	(1.)	
Percentage, . .	100	60·1	6·7	33	.	.	.	.	.	.	.	

NOTE TO FIGURES:—*p.v.*, portal vein; *s.v.*, splenic vein; *s.m.v.*, superior mesenteric vein; *i.m.v.*, inferior mesenteric vein.

13

PROCEEDINGS OF THE

ANATOMICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

FEBRUARY 1890.

A MEETING of the Society was held in the Library of the Medical School of St Mary's Hospital, on Wednesday, February 26, the President in the chair. Present—Thirteen members and visitors.

The minutes of the previous meetings were read and confirmed.

F. W. Andrewes, M.D., Wilfrid Balgarnie, F.R.C.S., and Charles Devereux Marshall were elected members of the Society.

T. F. Wilson, M.B., C.M., and F. E. Withers were proposed for election at the next meeting.

Dr JAMES CAGNEY read a paper on the *Effect of Supension upon the Spinal Column.*

He showed that in the dorsal part of the column traction produced slight elongation along the concavity of the curve, *i.e.*, along the fronts of the bodies of the vertebræ, and slight shortening along the convexity, *i.e.*, along the spinous processes. The axis of rotation passes transversely through the posterior wall of the vertebral body. The spinal cord lies therefore behind this axis, and in these regions is relaxed, not tightened by the process. In the cervical and lumbar regions the effect is the reverse upon the column, and as regards the bones, it nearly neutralises the dorsal alteration. But the cord lies so little in the lumbar region that the dorsal relaxation is not counteracted.

The Secretary read for Professor CLELAND a paper on *Fibro-Plates and Intervertebral Discs*, which will be found at page 373 of this volume of the *Journal of Anatomy and Physiology.*

Mr LOCKWOOD showed a specimen of *Interruption of the Small Intestine.* It was taken from a child who died four days after birth with symptoms of intestinal obstruction. The small intestine was completely interrupted about the middle of its course, and divided into two parts, the upper of which was dilated and filled in the fresh state with meconium, the lower shrivelled and empty. The mes-

entery continued without interruption, and there was no acquired disease, such as peritonitis, in the abdomen, by which the malformation could have been caused.

Professor Howes read a paper on *Variation in the Kidney of the Common Thornback (Raia clavata): its Nature, Range, and probable Significance*, which will be found at page 407 of this volume of the *Journal of Anatomy and Physiology*.

Mr E. W. Roughton exhibited a full-term fœtus, showing a well-marked *Sternalis muscle* on each side, and some additional muscular slips which he thought belonged to the subclavius.

In front of the manubrium there was a quadrilateral plate of fascia, into the upper corners of which the sternal portions of the sterno-mastoid muscles were continued. From the lower corners of the plate there proceeded a well-marked sternalis muscle on each side, that on the right side reaching as low down as the third intercostal space, and that on the left side reaching as far as the fifth interspace. The sterno-mastoids were not attached to the sternum, but were distinctly traceable into the sternalis muscle on each side. The m. sternales appeared to have no bony attachment.

Immediately behind the quadrilateral plate of fascia there was a narrow strip of muscle extending transversely across the thorax, the portion on the right side being continued into a tendon which spread out into a thin aponeurosis attached to the under surface of the clavicle, and blending with the capsule of the shoulder-joint. The portion on the left side ended externally in a small tendon which blended with the coraco-clavicular ligaments.

The gleno-humeral ligaments were well marked, but no connection between them and any part of the subclavius could be traced. The muscular slips above mentioned were held to be portions of the subclavius muscle as seen in carinate birds, and to support the theory advanced by Bland Sutton, attributing the origin of the coraco-clavicular and gleno-humeral ligaments to regression of portions of the subclavius muscle.

Mr E. W. Roughton also exhibited a dissection from the museum of St Mary's Hospital showing a well-marked sternalis muscle, the tendon of which was directly continuous with that of the sternal portion of the sterno-mastoid muscle. He considered that the specimens he had shown supported the theory that the sternalis was a portion of the sterno-mastoid muscle.

Dr William Hill exhibited the naso-pharynx of a sheep, showing the *Pharyngeal Tonsil* along the lower border of the vomer.

The meeting then adjourned.

PROCEEDINGS OF THE ANATOMICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

MAY 1890.

A MEETING was held in the Board Room of St George's Hospital, on Friday, May 30, 1890. Professor Humphry took the chair. Seventeen members were present.

The following gentlemen were elected members :—Professor J. T. Wilson and Mr F. E. Withers.

The following gentlemen were nominated for election at the next meeting :—C. H. Abbott, M.B. Lond., Assistant Demonstrator of Anatomy at St Thomas' Hospital, proposed by William Anderson, G. H. Makins, and F. G. Parsons; George Gulliver, M.A., M.B. Oxon, Assistant Physician and Lecturer on Comparative Anatomy at St Thomas' Hospital, proposed by William Anderson, G. H. Makins, and F. G. Parsons.

Professor STEWART showed two specimens of the *Pineal Eye* from *Varanus salvator*.

Mr BLAND SUTTON showed a *Rabbit's Spine containing a Half Vertebra on the Left Side of the Lumbar Region*. The specimen is in the College of Surgeons' Museum.

Professor MACALISTER said it was not difficult to show double centres in human lumbar vertebra.

Mr THOMSON had seen a dumb-bell-shaped human lumbar vertebra pointing to the double ossification, but had never actually seen the two centres.

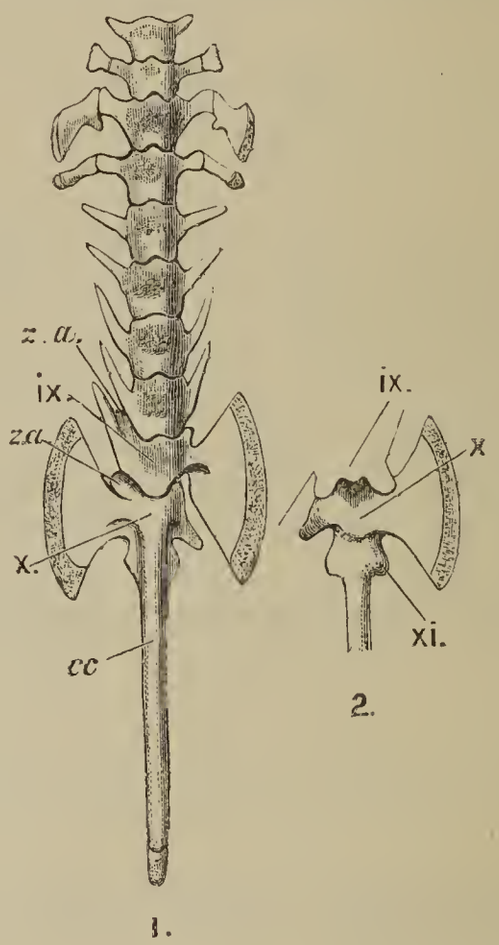
Professor G. B. HOWES mentioned that in all quadrupedal mammals the odontoid process had two ossifying centres in early extra-uterine life. He had only seen the deformity in this one specimen among many hundreds of rabbits.

Mr BLAND SUTTON showed sections of *Fallopian Tubes from Macacus rhesus*, and *Cervus eldi*, a Panolian deer. The specimens showed under the microscope branched projections into the lumen of the tube, with recesses between them. These, which in the adult form

longitudinal grooves down the tube, begin as pits by an involution of the mucous membrane like true glands.

Some difference of opinion was expressed as to the glandular nature of the recesses, and Mr Sutton promised to bring before a future meeting specimens showing the early stage of their development in the human fœtus.

Professor G. B. Howes exhibited the *Vertebral Skeleton of a Fire Toad* (*Bombinator*, ? sp.), which he had received from his pupil, Mr Arthur C. Jones, resident in Davos Dörfli, and made the following remarks thereon. The specimen (♀) was captured at Canton St Gallen;



Bombinator (? sp.) abnormal sacrum (♀) × 2. Fig. 1. Entire vertebral column, ventral view. Fig. 2. Coccygeal portion of sacrum, dorsal view.

its seven anterior vertebræ and pelvic girdle were normal, but special interest centered in its sacrum. The vertebral column of all living anurous amphibia bears normally nine free vertebræ, with the exception of *Pipa*, in which the number is reduced to eight, most probably by the excalation of that answering to the second vertebra of other forms (v. Hering, *Morph. Jahrb.*, Bd. vi. p. 297) rather than by concrescence, as was formerly supposed. On the other hand, more than nine free vertebræ appear to have existed in some extinct Anura (*cf.* Portis, *Atti R. Accad. Sci. Torino*, vol. xx. p. 1173, 1885). Abnormal sacra have been described in the Anura by Götte (*Entwicklungsgesch. d. Unke*, Leipzig, 1875, taf. xix.); Bourne (*Quart. Jour. Micr. Sci.*, N.S., vol. xxiv. p. 83); Howes (*Anat. Anz.*, 1886, p. 277);

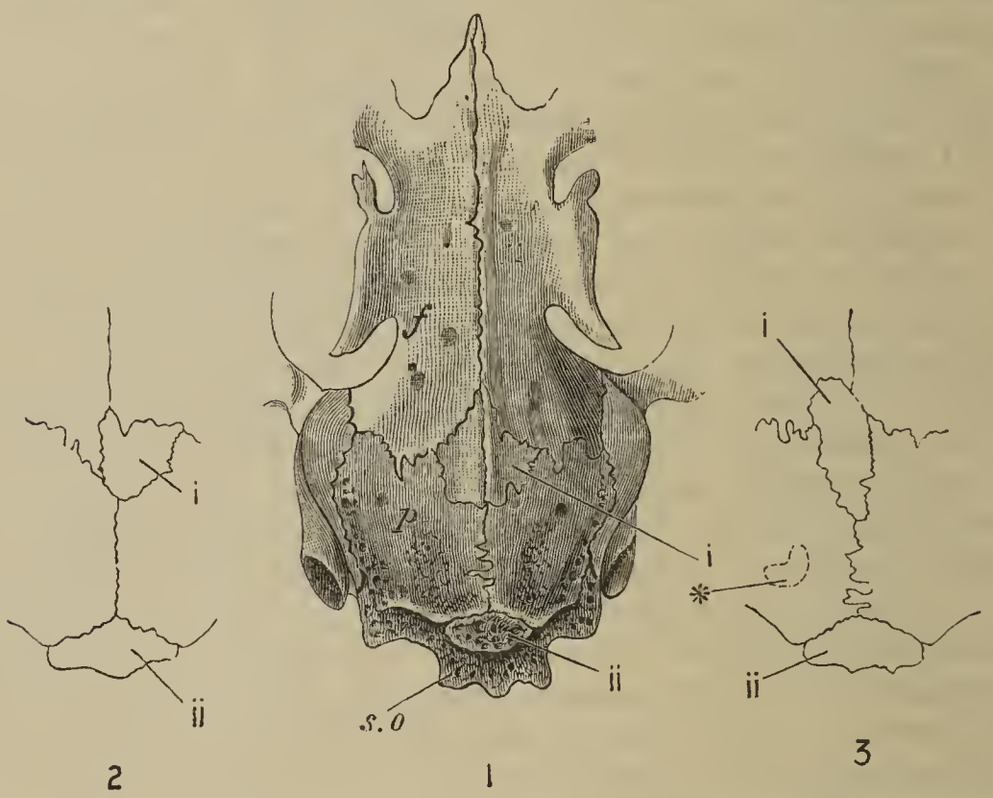
Morgan (*Nature*, vol. xxxv. p. 53); Sasserno (*Atti R. Accad. Sci. Torino*, vol. xxiv. p. 703), and others, and in the tailed Amphibia (*Menopoma*) by Huxley (art. "Amphibia," *Encyc. Brit.*, 9th ed., vol. i. p. 752 [*cf.* Lucas, *Americ. Nat.*, 1886, p. 561]). Conspicuous among the individual variations recorded are those in which, while the normal sacrum existed, the last pre-sacral vertebra had developed a sacral transverse process, whereupon there were present, on one or both sides as the case might be, two sacral vertebræ. This line of variation was especially interesting as showing an approximation towards a more marked condition of the same described by Walterstorff (*Jahrb. Naturwiss. Vereins. Magdeburg*, 1885–86), for the extinct *Palæobatrachus*, in which three sacral vertebræ were often, if not always, present—a culminating term in the amphibian series which Walterstorff would exalt to a family distinction.

The sacrum of *Bombinator* is known, from the researches of Boulenger (Walterstorff, *op. cit.*, 1886, p. 155), Sasserno (*cf. ante*), and others, to be subject to an exceptional degree of variation. In the individual example exhibited the sacral transverse process of the right side had become replaced in one derivative of the head of the potentially segmented urostyle or coccyx (*cc.*), the condition being the reverse of one described by Sasserno (*loc. cit.*, pl. xii. fig. 14), a gap in whose series was thus filled. This individual appeared to agree in its leading peculiarities with one briefly described by Camerans (*Atti R. Accad. Sci. Torino*, vol. xv. p. 448). In those Anura for which a post-sacral sacrum has been hitherto recorded, the assumption of a sacral function on the part of the tenth vertebra was found to be largely accompanied by the dismemberment of the latter from the head of the urostyle; in the specimen exhibited, however, as in some of Sasserno's examples, this had not taken place, wherefore a *coccygeal sacrum* had been formed. The only other features of interest in the specimen were the great enlargement of the right anterior zygapophysis of the ninth (normal sacral) vertebra, successionally with one specially developed from the corresponding border of the coccyx (*z.a. z.a.*), at the point of origin of the abnormal sacral transverse process.

Professor Howes concluded by saying, that the fact that terrestrial vertebrata possessed of but nine free vertebræ, should exhibit variation in the same, of the nature to which he had alluded, was *really* remarkable; and he regarded Sasserno's discoveries as welcome testimony to the belief for which he had previously argued before the Society (this Vol., p. 420)—that extreme individual variation, as affecting individual organs, is most marked in specialised forms of life.

Professor G. B. Howes also exhibited and made some remarks upon the *Crania of Three Rabbits* (*Lepus cuniculus*), showing the presence of Wormian bones in the coronal and sagittal sutures. Such specimens are of rare occurrence, and Gruber found (in Man) but 43 of them in 10,000 skulls examined. He had been on the alert for examples for the last four years; as the skulls exhibited were the

only ones, out of some hundreds which had passed through his hands during the period named, which showed the peculiarities in question, and as no mention of the same is made either by Nathusius (*Die sogenannten Leporiden*, Berlin, 1876), Krause (*Anat. des Kaninchens*, Aufl. 2, 1884), or by authors of the more didactic laboratory handbooks, he considered it worth while to place the facts on record in the interests of the junior student. Of the three specimens exhibited, that which first came under his notice bore a bone on the right side only, details of which are given in the accompanying figure (fig. 2); having later acquired a skull in which the reverse obtained (fig. 3), he was expectant of meeting with one in which a paired condition might have occurred. Such a one fell to his lot after an interval of two years; and it will be seen that in it (fig. 1) the bones were, as nearly as could be, bilaterally symmetrical.



Lepus cuniculus. Skulls, showing inter-frontal bones (ossa anti-epileptica). Nat. size. *f*, frontal; *p*, parietal; *s.o*, supraoccipital; i, inter-frontal bones; ii, interparietal.

Bones of the category under consideration have long been known in all leading orders of mammals; the only mention of such in the Leporines is that of Wenzel Gruber,[1] who has recorded (p. 26) in the variable Hare (*L. variabilis*) the presence of a single bone, the exact position of which he does not describe. The rabbits and hares are exceptional among placental mammals for the great specialisation and constancy of the characters and relationships of their interparietal (ii.), the longer retention of its independence being characteristic of the Rabbit's skull as distinguished from that of the Hares (*cf.* Nathusius, *loc. cit.*, p. 29). Nathusius has shown

[1] *Mém. Acad. Imp. Sci. St Pétersb.*, t. xix., No. 9, 1873. For this reference Prof. Howes was indebted to Prof. Alex. Macalister.

that the interparietal may be, in the Leporine, occasionally paired and bilaterally symmetrical; Professor Howes had satisfied himself that the assumption of that condition has resulted from a bilaterally symmetrical mode of ossification such as is more constant in the *Cetacea* and some *Insectivora* (*Erinaceus*, *Microgale*, [Parker, *Phil. Trans.*, part i., 1885]) and as may be instituted for the lineally disposed supraoccipital under lateral expansion (*Cetacea*).

Commenting upon the facts mentioned, he drew attention to the resemblances between the paired condition of the os antiepilepticum and its intercalation between the frontal bones, as compared with the paired interparietal of Nathusius and its intercalation between the parietals. The first-named lay wholly within the area of the normal parietals, and he regarded them as dismembered portions of these bones, indicative of that process of fragmentation (of which one specimen [* fig. 3] appeared to show additional traces) which may in rare instances lead up (in Man) to their replacement in a tesselated series of Wormian bones.

Mr F. G. Parsons showed an *Occipital Bone with a Process facetted to articulate with the Odontoid Process.*

Mr Bland Sutton remarked that Mr Arbuthnot Lane had brought forward evidence to show that cases such as this, and those of anchylosis in the same situation, were the result of pressure from weights carried on the head. He had himself found similar anchylosis in the bodies of oxen near Paris, where they are harnessed by the head.

Professor Humphry reminded the meeting, on the other hand, that a spur occasionally grew downward from the anterior tip of the foramen magnum without articulating with the odontoid process. This could hardly be a result of pressure from above.

Mr F. E. Withers showed a *Popliteal Artery*, which at the lower border of the popliteus muscle divided into four branches, the anterior and posterior tibial, the peroneal, and the nutrient artery to the tibia. Also, an *Abnormal Extensor Muscle* at the back of the wrist. Arising from the ulna and the interosseous membrane between the extensor secundi internodii pollicis and the extensor indicis, and passing under the annular ligament with the extensor communis, it divided into two tendons, the larger of which partly blended with the tendon of the extensor secundi internodii, and partly ended in the aponeurosis on the back of the first phalanx, while the smaller ended in the aponeurosis on the back of the index. The two tendons were united by a fibrous vinculum passing downward and inward from the former to the latter.

Mr W. H. Bennett and Dr H. D. Rolleston showed two specimens of *Abnormalities around the Cœcum.*

Mr William Anderson and Mr G. H. Makins read a paper on the *Subperitoneal and Subpleural Planes of Connective Tissue*, with their extensions.

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PROCEEDINGS OF THE
ANATOMICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

NOVEMBER 1890.

The Fourth Annual General Meeting was held at Charing Cross Hospital School Buildings, on November 26, 1890. Professor Humphry in the chair. Present twenty-eight members and visitors.

Dr George Gulliver and Mr C. H. Abbott were elected members of the Society. The following gentlemen were nominated for election:—Mr Percy Dean, Demonstrator of Anatomy at the London Hospital; Professor Anderson Stuart of the University of Sydney; Dr Herbert Waterhouse, Demonstrator of Anatomy at Charing Cross Hospital; and Mr Percival M'Leod Yearsley, Demonstrator of Anatomy at the Westminster Hospital. The following gentlemen were then elected as officers for the ensuing year:—*President*—Sir W. Turner, F.R.S.; *Vice-Presidents*—D. J. Cunningham, M.D., Alexander Macalister, F.R.S., G. D. Thane; *Treasurer*—G. B. Howes; *Secretaries*—Ambrose Birmingham, M.D. (*Ireland*), W. P. Herringham, M.D. (*England*), J. Yule Mackay, M.D. (*Scotland*); *Council*—Wm. Anderson, H. St John Brooks, M.D., Stanley Boyd, W. H. H. Bennett, John T. Charles, M.D., John Cleland, M.D., F.R.S., John Curnow, M.D., Wardrop Griffith, M.D., David Hepburn, M.D., C. B. Lockwood, Clement Lucas, A. M. Paterson, M.D., R. W. Reid, M.D., Charles Stewart, J. Bland Sutton, Johnson Symington, M.D., Arthur Thomson, M.B., Frederick Treves, Bertram Windle, M.D., Alfred H. Young, M.B.

The following resolution was then proposed from the chair and carried unanimously.

"That the following be made a Rule of the Society:—

> "Rule 22.—The Council are empowered to nominate a limited number of persons who have distinguished themselves in promoting the science of anatomy, for election as Honorary Members of the Society. The election shall take place at an Annual Meeting, and a list of the nominations shall be sent to each Member with the notice of the Meeting."

The Treasurer then made a statement of accounts showing a balance of £7, 13s. 0d. in favour of the Society.

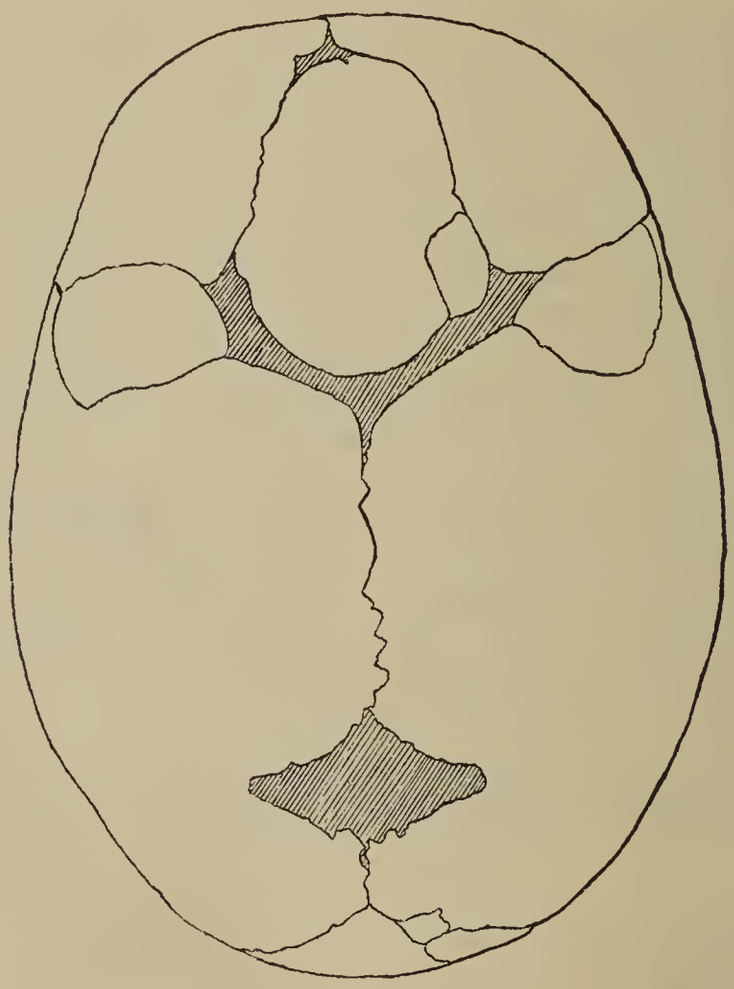
Professor HUMPHRY, then vacating the chair, made a short farewell speech to the Society.

A vote of thanks to the retiring President was proposed by Professor THANE seconded by Professor MACALISTER, and carried unanimously.

Professor HUMPHRY resumed the chair by request for the remainder of the meeting.

The following papers and specimens were then brought before the Society :—

Dr G. GULLIVER showed a *Skull with Wormian Bones in the Frontal Suture.* The specimen is the calvaria of the skull of a child aged four months. In the anterior fontanelle is a large rhomboidal median ossification, filling up the whole space except at the upper part, where a narrow margin of membrane is left. Extending



out into the frontal suture from this membranous margin of the fontanelle there is on each side a large bony plate, the two varying so little in size and extent that they may fairly be described as symmetrical. As matters of less importance it may be noted that there is a separate ossification in the occipito-parietal sutures, and that the sagittal fontanelle persists.

Bones in the situation of these appear to have been described under the names of Wormian bones, anterior fontanelle bones, and

more recently as interfrontal bones by Howes, who, in common with Humphry and Hyrtl, says they are of rare occurrence.

Such bones cannot, of course, be due to arrest of development, like the interparietal bone when found in man, though possibly they may be regarded as evidence of reversion towards ancestral types such as the Ganoid fishes, where we find median and lateral rows of bony plates throughout the body.

It is interesting to note that the child was the subject of much congenital deformity—hare-lip, cleft palate, fissure of the iris and supernumerary auricles.

Professor Alexander Macalister exhibited—

1. Egyptian Skulls, one of which showed a ring of bone projecting downwards from the lower surface of the occiput behind the posterior condyloid foramen; another showed on the inner wall of the orbits a junction of the frontal and palate bones behind the ethmoid plate.

2. Specimens illustrating (*a*) the cervical fascia near the base of the skull, (*b*) muscular and vascular anomalies, (*c*) new methods of preservation and exhibition.

Professor Stewart demonstrated a section of the *Scalp of an Adult Negro* showing the curved hair follicles.

Mr Arthur Thomson read a paper on *The Skin and Hair of an Negro Fœtus*, which will be found at p. 272 of the January number of the *Journal of Anatomy and Physiology*.

Mr F. G. Parsons showed two specimens of the *Short Muscles of the Thumb*, lent by Professor Stewart from the Museum of the College of Surgeons. In both of these the deep part of the flexor brevis pollicis or adductor obliquus was inserted into the whole length of the metacarpal bone of the thumb, as well as into the other insertions described in the text-books. This insertion into the metacarpal bone was looked upon as the deep part of the opponens pollicis, as, in one of the specimens, the superficial part could be seen as a distinct thin lamina separated from it in the whole of its course. With a view to determine the constancy of this arrangement eight other hands were dissected, in none of which did the adductor obliquus send any fibres to the metacarpal bone, but in all of them the opponens was easily separable into a thin superficial stratum and a much thicker deep stratum connected either at the origin or insertion with the adductor obliquus. The superficial lamina, moreover, arose from the outermost part of the anterior annular ligament, while the deep part took origin underneath it from the same half of the ligament. Between the two layers a distinct cellular interval was frequently found.

All the preparations showed a distinct muscular slip arising from the front of the lower part of the shaft of the 2nd metacarpal bone at the place where the radial artery crosses it. If the radial artery is to be regarded as the division between the adductor transversus and adductor obliquus, this slip should be considered as part of the

former muscle rising from the 2nd metacarpal bone. If, on the other hand, the slip is looked upon as adductor obliquus, then the radial artery should be described as piercing that muscle.

In most text-books the radial artery is described until it pierces the 1st dorsal interosseous muscle, and is taken up again when it appears in the palm between the adductors transversus and obliquus, but between these two points there is half an inch of artery lying between two layers of muscle, the posterior being adductor transversus or obliquus according to the taste of the describer, and the anterior adductor obliquus.

The slip from the lower part of the 2nd metacarpal is quite distinct from the common origin of the adductor obliquus from the bases of the 2nd and 3rd metacarpals and from the front of the os magnum and trapezoid, but it shows more tendency at its insertion to join the adductor obliquus than transversus; the radial artery should therefore be described as piercing the adductor obliquus after giving off the radialis indicis and finally emerging into the palm between the adductor transversus and obliquus.

Several of the preparations showed the expansions from the short muscles to the extensor secundi internodii tendon. Of these the external is quadrilateral, and is derived from the abductor pollicis entirely, while the internal is triangular with its base attached to the extensor tendon, the apex being a small rounded tendon in which a fasciculus of the adductor obliquus ends. This fasciculus lies in the midst of the muscle, and is surrounded by fibres which are inserted into the metacarpal phalanx of the thumb.

The adductor transversus passes chiefly in front of the adductor obliquus, and contributes few, if any, fibres to the inner expansion.

Mr C. B. Lockwood showed several specimens of *Synostosis of the Vertebræ*. Some were probably due to disease, and consisted in union of the bodies of vertebræ by bridges of bone in the situation of the anterior common ligament, and by ossification of the intervertebral discs. In all of these specimens the outgrowths of bone were eccentric, and did not protrude at all into the spinal canal. In one of the specimens the articular facets of the axis and third cervical vertebræ were firmly synostosed on the right side; and in this case the evidences of disease were absent, suggesting that the fault may have been congenital. In one of the spinal columns in which dorsal vertebræ were synostosed the lamina of the 4th lumbar vertebra was divided by a cleft which ran through it betwixt the superior and inferior articular facets of the right side; the left lamina was intact. This defect seemed to be rather common in the 5th lumbar vertebra and might affect both sides. It was quite inexplicable by reference to ordinary accounts of the ossification of vertebræ.

The Meeting then adjourned.

PROCEEDINGS OF THE ANATOMICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

FEBRUARY 1891.

A MEETING of the Society was held on Monday, February 23, 1891, in the Westminster Hospital School Buildings. Twenty-six members and visitors were present, and Sir W. TURNER, the President, took the chair for the first time.

The Minutes of the previous Meeting were read and confirmed. The following gentlemen were elected Members of the Society:—Messrs Percy Dean; Herbert E. Waterhouse; Percival M'Leod Yearsley; and Professor Anderson Stuart. The following were nominated for election:—C. S. Sherrington, M.B., Lecturer on Physiology at St Thomas' Hospital, proposed by G. D. Thane, William Anderson, and W. P. Herringham; A. W. Hughes, M.B., C.M., M.R.C.S., Lecturer on Anatomy at the School of Medicine, Edinburgh, proposed by Johnson Symington, D. J. Cunningham, and W. P. Herringham; and T. W. P. Lawrence, M.B., F.R.C.S., Curator of the Museum at University College, London, proposed by G. D. Thane, Alexander Macalister, and W. P. Herringham.

Professor MACALISTER showed a series of specimens to illustrate the *Periosteal Ligaments.*

Mr WILLIAM ANDERSON showed a Left Clavicle, probably female, presenting a marked *Articular Process in the Region of the Conoid Tubercle*, which must have articulated with the coracoid process. The corresponding scapula was not in his possession. He suggested the possibility of such an anomalous articulation being formed as the result of raising the upper limb to support a weight carried on the head. Reference was made by several speakers to a similar explanation given by Mr Arbuthnot Lane.

Mr BALGARNIE showed an abnormal *Ligamentous Radio-Ulnar Band* which stretched from the upper and inner surface of the coronoid process of the ulna to the tubercle of the radius, the outer edge of which it crossed to be inserted at the lower part.

It lay above the insertion of the biceps tendon, and in a direction nearly parallel to the oblique ligament.

Its action was evidently to limit supination.

Dr Andrewes had seen a similar specimen in which the band was very much larger and stronger than that exhibited.

The Secretary read for Mr Elworthy notes of a case presenting *Abnormalities in the Hepatic Artery and the Intestine supplied by it.*

The body was that of a large adult male. The cœliac axis sprang from the aorta in the usual position, and gave off the gastric and splenic arteries, which ran a normal course to their destinations. Two hepatic arteries sprang from the axis. The upper or left hepatic having given off the gastroduodenal, and half an inch further a small pyloric branch, which ran leftwards to the pylorus, entered the left lobe of the liver at the transverse fissure. The gastroduodenal itself also gave off a branch upwards, which divided into four small arteries, one going to the neck of the gall bladder, the rest entering the liver at the transverse fissure. The lower or right hepatic ran to the right, behind the portal vein and common bile-duct, gave a large branch which ran along the gall bladder to its fundus, and then divided into three other large branches which entered the right lobe. A small branch ran from the cœliac axis to the pancreas.

The following abnormalities were noticed in the intestine. The stomach lay wholly to the left of the middle line, the pylorus being on the left side of the vertebral column opposite the first lumbar vertebra, and the first part of the duodenum passed behind the peritoneum to the right side of the second lumbar. Both pylorus and duodenum were close upon the spine, and the latter had no mesentery or freedom of movement. The second part of the duodenum turned downward to the body of the third lumbar vertebra as usual.

The head and tail of the pancreas were normal, but were joined by a small isthmus over the spinal column which was only the breadth of a finger.

There was no pathological condition in this region. It seemed rather as if the obliteration of mesentery, which naturally occurs at the second and third parts of the duodenum, had spread to the first part also, and had tied this down to the posterior abdominal wall.

A further abnormality noted was a peritoneal pouch passing up behind the splenic flexure of the colon, in what would naturally have been the costo-colic ligament, and running for a distance of three inches between the diaphragm and the greater sac of the peritoneum.

Dr Herringham showed a specimen of *Right Aorta with persistent Left Aortic Root giving Origin to the Left Subclavian.* The heart was normal in position. The aorta passed upwards and to the right, turned backwards to the right side of the trachea and œsophagus, and passed

to the left between the œsophagus and the vertebral column. The position of the thoracic duct was not noted. The branches were given off in the following order: first, the left carotid, which, rising from the left side of the aorta at the first bend, passed upwards to the left in front of the trachea to the root of the neck; second, the right carotid, which, rising close to the left artery, passed vertically upwards; third, the right subclavian, which, given off from the back of the second part of the aorta, a full inch from the origin of the right carotid, passed outwards over the rib as usual. No branches were given off while the artery was crossing the spine. On reaching the left side part of the original left aorta was seen persisting as a blind pouch, about an inch in length, projecting forward from the main trunk at the angle between the transverse and downward parts of its course, and coming to the level of the front wall of the trachea. From the end of this blind pouch on the outer side arose the left subclavian, and on the inner side the ligamentum arteriosum was attached.

The recurrent laryngeal nerve of the right side ran round the right aortic arch; that of the left side was not traced. The aorta had become uniformly dilated, and killed the patient from whom it was taken by compressing the trachea forwards. It had also caused paralysis of the right side of the larynx by pressure on the recurrent laryngeal nerve, which was swollen and adherent to the vessel as it hooked underneath it.

Mr Stanley Boyd showed the plantar half of a *Divided Internal Cuneiform* of the foot.

The Secretary for Professor Windle showed two specimens of the *Stylo-Auricularis Muscle*, and two of a *Ligament* in the same situation, and read the following note thereon:—

"The two specimens of stylo-auricularis muscle were both found in the present winter session, and indeed within two days of one another, which is the more curious since they are the only specimens which I have ever seen. In his *Catalogue of Muscular Anomalies*, Macalister (p. 6) says that he never observed a well-marked instance in any of the subjects, nearly 700 in number, which he had noted. It appears, therefore, that it is an anomalous muscle of extremely rare occurrence. The name which I have used is that which was given to the muscle by Hyrtl, Lauth calling it depressor auriculæ, and Wenzel Gruber describing it as an auricular slip to the stylo-glossus.

"In one of my specimens the muscle is continuous by its tendon of origin with the stylo-glossus, but also arises in part from the styloid process. It is inserted into a spur of cartilage which projects from the lower part of the cartilaginous portion of the external auditory meatus, just where that portion joins the bony canal.

"The second specimen, which came from a different subject, may best be described as arising by a muscular belly from the stylo-glossus. This belly develops a tendon to which a second muscle is connected, which is inserted in the same manner as the last-mentioned specimen.

"On looking up the subject in Macalister's work, I found that he

stated that its place was often occupied by a fibrous cord. I examined the region on both sides in the subject which I happened to be using at the time for lecture purposes, and found this band on both sides. On the one it was poorly marked, but sufficiently definite, especially in the recent state, and lay along the styloid process, passing to the cartilaginous spur already mentioned. On the other, it was exceedingly well-marked and definite, and passed from the stylo-glossus to the same spur."

The PRESIDENT then read a paper on a *Human Cerebrum with remarkably modified Fronto-Parietal Lobe*, which will be found at p. 327 of this volume of the *Journal of Anatomy and Physiology*. The President's opinion, as well as that of other speakers, was that the modification was of pathological origin, and of pathological rather than of morphological importance.

The PRESIDENT then gave the following account of the *Relationship of the Alveolar Form of Cleft Palate to the Incisor Teeth*:—

"In January 1855 I described, in vol. xix. of the *Journal of Anatomy and Physiology*, a series of fifteen casts of the roof of the mouth in cases of cleft palate, which I had examined with reference to the question of the relation of the cleft through the alveolar border of the jaw to the incisor teeth. From an analysis of these specimens, and of forty-nine specimens which had previously been described by Dr Theodore Kölliker, I stated that they might be divided into two groups—one in which a precanine tooth was situated between the canine tooth and the alveolar cleft, and in it were fifty-one specimens; the other consisting of thirteen specimens, in which no precanine tooth was situated between the canine tooth and the cleft. I then discussed the bearing of these observations on the theory promulgated by Dr Albrecht, that in the alveolar form of cleft palate the gap is not, as is usually stated, in the maxillo-intermaxillary suture, but is situated within the intermaxillary bone, which would arise, therefore, from two distinct centres of ossification.

"During the present winter I have had, through the kindness of Mr Bowman Macleod, L.D.S., the Dean of the Edinburgh Dental School, the opportunity of examining the upper jaw of a youth, aged 14, affected with mesial cleft palate and double alveolar clefts, in whom all the permanent teeth, except the wisdoms, had erupted. None of his permanent teeth had been extracted, so that one saw the upper dental arch exactly in the condition which had been produced by the maldevelopment of the upper jaw. A pair of teeth, which from their form were obviously central incisors, were on the mesial side of the double alveolar clefts, in the most anterior part of the jaw, which had been pushed somewhat to the right, so that the right central incisor overlapped the root of the right canine. Two permanent molars, two bicuspids, a canine and a precanine, were on the outer side of each alveolar cleft. Each cleft was therefore situated between the incisor and the precanine tooth of its own side.

"Another case bearing on the same question has also occurred during

the winter in the practice of my colleague, Professor Chiene, to whom I am indebted for the opportunity of examining a cast of the deformity. The patient, a young man aet. 21, had hare-lip, mesial cleft palate, and left alveolar cleft. The permanent teeth were all erupted except the wisdoms, and were present in the upper jaw, the crown of the right lateral incisor having, however, been broken off, so that only a stump was left. On the right side central and lateral incisors had erupted. On the left side the central incisor, which was set obliquely in the intermaxilla, bounded the median side of the cleft, and the lateral side was bounded by a precanine tooth, somewhat smaller than the usual size of a lateral incisor.

"If the precanine teeth in these specimens are to be regarded as incisor teeth—that is, as teeth developed in association with the intermaxillary part of the upper jaw—it would follow that the alveolar cleft in each instance was within the intermaxillary bone, and not in the suture between it and the superior maxilla; whilst the precanine tooth would be the outermost incisor.

"These specimens, therefore, so far as we can base the argument on the position of the incisor teeth, support the view that the alveolar cleft is within the intermaxillary bone, and not in relation to its lateral border."

Professor Curnow remarked that this was the best explanation of some of the numerous specimens of premaxillary bones removed by Sir William Ferguson from cases of alveolar cleft palate, and placed in the Museum of King's College, London.

Professor D. J. Cunningham exhibited the Skull and some of the other bones of the *Skeleton of the Irish Giant*, Cornelius Magrath. He stated that for 131 years this skeleton had been preserved in the Trinity College Museum, Dublin. It measured 7 ft. $2\frac{1}{4}$ in. in height, and the condition of the skull was such that he was led to believe that Magrath had suffered during life from acromegaly. The face (more particularly the mandibular part), was large in proportion to the cranium, and the pituitary fossa was enormously expanded. Indeed, the sphenoidal air-sinus was completely obliterated, and there was a perforation right through the base of the skull, which was only closed below by the vomer. Further, there were signs which seemed to indicate that the enlarged pituitary body had extended into the right orbital cavity through the sphenoidal fissure.

Dr Cunningham considered the case to be one of interest, because it seemed to show some connection between general giant-growth and acromegaly, and he referred to Langer's observation, that in men of gigantic growth the pituitary fossa is usually expanded. He had examined the skeleton of Byrne, the giant, in the College of Surgeons Museum, and had noticed many points in which it resembled Magrath's skeleton. He was particularly interested to find in the skull a distinct expansion of the pituitary fossa.

Dr Cunningham objected to the term "acromegaly," and stated that

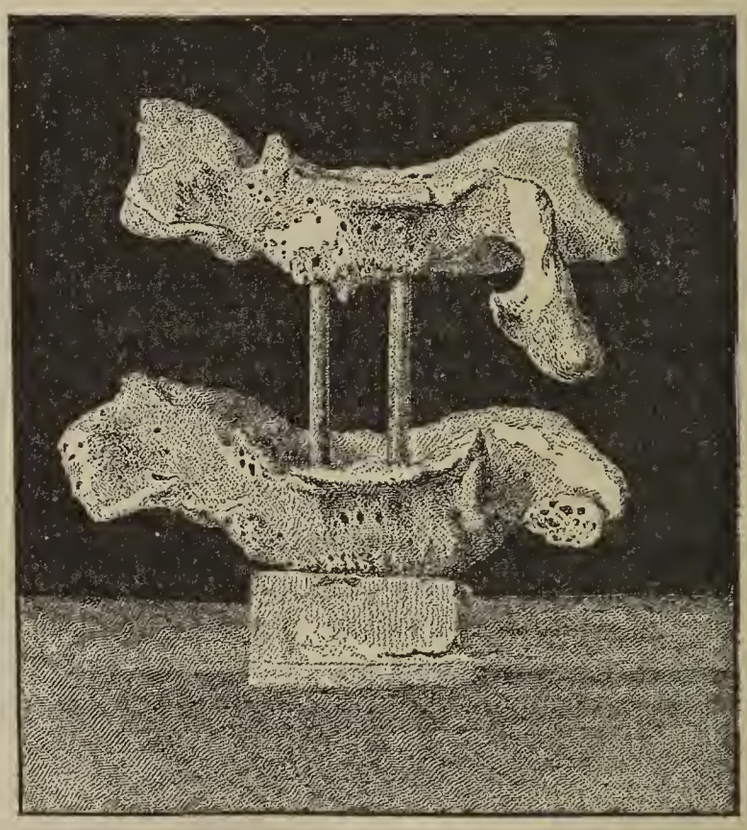
his classical friends in Dublin had suggested the much more correct term of "megalacria" for the disease.

The PRESIDENT referred to the strong resemblance between the appearance of the skull of Magrath and that of a specimen in the Anatomical Museum of the University of Edinburgh, photographs of which he exhibited, which was described by Dr Alexis Thomson in the *Journal of Anatomy and Physiology*, July 1890.

Mr A. S. GRÜNBAUM showed an *Anomalous 6th and 7th Cervical Vertebræ* (see fig.), and read the following note thereon :—

"This is an instance of non-union of the costal process of the 7th cervical vertebra with the body and transverse process, being joined, however, to the costal process of the 6th cervical vertebra by a bar of bone; all three portions being perfectly continuous and united.

"There are two articular surfaces on the 7th vertebra for costal process: one on the body of the vertebra is smooth, and directed backwards and outwards; the other, on the lower edge of the anterior surface of transverse process, just internal to the tubercle of the transverse process, is rough,—to form a synchondrosis,—and directed downwards and inwards. The surfaces on the detached costal process



correspond, and are, of course, directed in the opposite direction. In the 7th cervical vertebra, the costal process and the bony lamella connecting it with the transverse process pass insensibly into one another; the detached portion in this case, as would be expected, involves both.

"The bar of bone joining this with the costal process of the 6th descends from the tubercle of the latter—less prominent than ordi-

narily in this case—going slightly outwards and becoming slightly flattened and broader as it descends to fuse with the process of the 7th. It thus divides the entrance to the intervertebral foramen into two parts—an anterior and a lateral portion, the former being obviously for the vertebral artery, and the latter for the nerve.

"The ossified portion between the two vertebræ evidently corresponds to the anterior superior costo-transverse process."

Mr A. S. Grünbaum then showed *Two Cases of Excavations in the Skull due to Dilatations on Lateral Sinus.*

On the first skull in which this was observed the left jugular fossa, viewed from below, appeared elongated backwards and divided into two portions by a thin bridge of bone running transversely across it. Viewed from the inside, however, it was seen that the orifice was narrower below than above, and had probably nothing to do with the jugular foramen. It seems to have arisen from a varicosity or dilatation at the lower end of the lateral sinus, which first pitted and then perforated the bone. The lamella of bone which thus remains forming the posterior wall of the jugular bulla is convex towards the latter, with rather sharp edges. The opening is oval in shape, and 10 mm. long by 4 mm. broad, and the depth of the canal formed, 10 mm. The groove for the lateral sinus is well marked, and the bones of the skull altogether rather thinner than normal.

In a second specimen the perforation had not actually taken place; but a fossa with exceedingly thin floor existed in precisely the same position on the right side. In this case, too, the groove for the right lateral sinus was extremely well marked. The depth of the fossa was 7 mm.

Mr Grünbaum then demonstrated some points in the *Anatomy of the Sub-occipital Region*, an account of which will be found at p. 428 of this volume of the *Journal of Anatomy and Physiology.*

Professor D. J. Cunningham then showed several specimens of Human Fœtal Brains, ranging from the fourth up to the eighth month, showing that the three radial "primärfurchen" of Bischoff and Pansch are repeated upon the surface of the *insula*, and form these three sulci, which correspond in their later development to the sulcus præcentralis, the fissure of Rolando, and the sulcus post-centralis of the cerebral mantle. This subject is discussed more fully by the author in a paper on the *Island of Reil* in the April number of the *Journal of Anatomy and Physiology*, p. 378.

The meeting then adjourned.

PROCEEDINGS OF THE ANATOMICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

MAY 1891.

A MEETING of the Society was held on Monday, May 25, 1891, at University College, London.

The President, Sir WILLIAM TURNER, took the chair. Twenty-one members and visitors were present.

The minutes of the previous meeting were read and confirmed.

The following gentlemen were elected members of the Society :—C. S. Sherrington, M.B.; A. W. Hughes, M.B., C.M.; T. W. P. Lawrence, M.B.

The following gentleman was nominated for election at the next meeting : —Edward Fawcett, M.B., C.M., Demonstrator of Anatomy at the Yorkshire College. Proposed by T. Wardrop Griffith, D. J. Cunningham, and Matthew J. Oliver.

Professor THANE gave an account of two *Abnormal Muscles of the Leg* :—

In the one specimen, which was exhibited, the abnormality consisted in the presence of a large *peroneo-calcaneus internus* (see figure 1). The fleshy mass arising from the lower two-thirds of the posterior surface of the fibula was divided longitudinally into two parts of nearly equal size; the inner of these had the normal arrangement of the flexor longus hallucis; the outer ended behind the ankle-joint in a tendon which passed beneath the internal annular ligament with the flexor longus hallucis, and was inserted into the fore part of the inner surface of the os calcis, just below the sustentaculum tali, and imme-

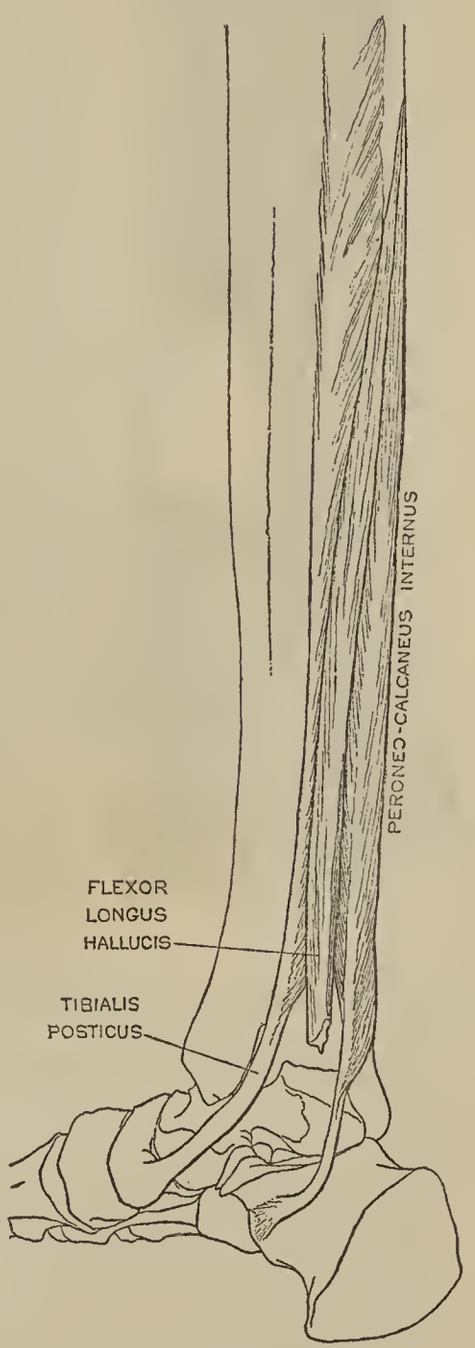


FIG. 1.

diately external to the groove of the flexor longus hallucis. Examples of the peroneo-calcaneus internus, generally of small size, have been recorded by Meckel,[1] Macalister[2] (by whom the muscle was thus named), Davies-Colley, Taylor and Dalton,[3] Curnow,[4] and Knott,[5] while H. Hartmann[6] has described a specimen agreeing almost precisely with the one exhibited. Hinterstoisser[7] has seen a similar muscle arising from both the tibia and fibula, and named it *tibio-peroneo-calcaneus internus*. Meckel regarded the muscle as the homologue of the pronator quadratus of the upper limb, and Macalister compared it to the ulno-carpal slip sometimes detached from the pronator quadratus; while Testut[8] and Hinterstoisser look upon it as a reduced flexor accessorius longus. Turner[9] has described several cases of accessory muscles in the region of the inner ankle.

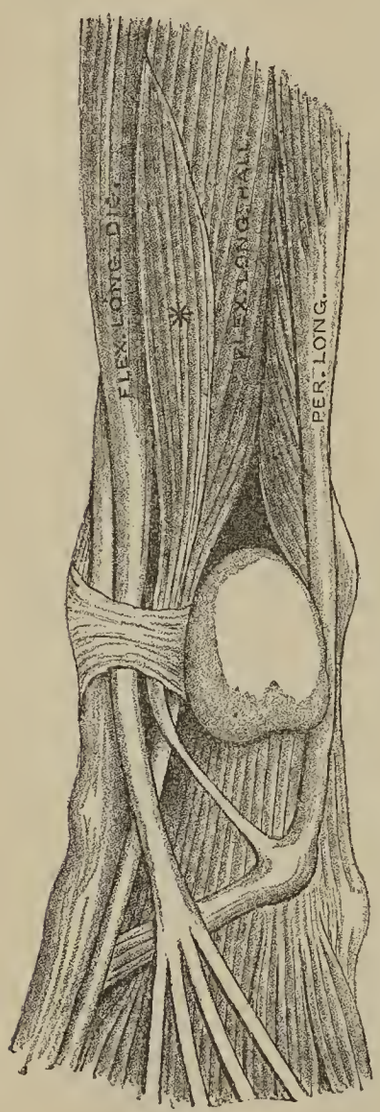


Fig. 2.

In the second case (fig. 2) the flexor accessorius of the foot was wanting. In the lower third of the leg there was a supernumerary muscular belly (* in figure) arising from the fascia over the flexor longus hallucis, and having the appearance of a flexor accessorius longus; this belly passed beneath the annular ligament with the flexor longus hallucis, and then ended in a tendon which crossed obliquely over the long plantar ligament to be inserted into the sesamoid bone in the tendon of the peroneus longus: it had no connection with the flexors of the toes. That this muscle is, however, a modified flexor accessorius longus, would seem to be shown by the condition met with by Chudzinski in the dissection of an Annamite.[10] Here there was no accessorius in the left foot, but there was a muscle arising from the tibia and fibula, and inserted into the sesamoid bone in the peroneus longus tendon as in the case now reported; while in the right limb the flexor accessorius was a fusiform muscle arising from the intermuscular fascia of the leg and ending in a tendon which bifurcated, the smaller part joining the tendon of the flexor longus digito-

[1] *Handb. d. menschl. Anat.*, 1816, vol. ii., p. 587.
[2] *Further Notes on Muscular Anomalies in Human Anatomy*, Dublin, 1868, p. 14.
[3] *Guy's Hospital Reports*, 3rd series, vol. xviii., 1873, p. 395.
[4] *Journal of Anatomy and Physiology*, vol. vii., 1873, p. 307.
[5] *Abnormalities in Human Myology*, Dublin, 1881, p. 23.
[6] *Bull. de la Soc. Anat. de Paris*, 1888, p. 1044.
[7] *Wiener Jahrbücher*, 1887, p. 410.
[8] *Les Anomalies Musculaires chez l'Homme*, Paris, 1884, p. 699.
[9] *Trans. Roy. Soc. Edin.*, vol. xxiv., p. 185, 1865.
[10] *Revue d'Anthropologie*, 1882, p. 623.

rum, and the larger passing to the ligaments of the second row of tarsal bones, thus forming a transition between the mode of termination of the common long accessory muscle and the more anomalous form running to the peroneus longus. In another instance Professor Thane had seen a small fibrous slip springing from the os calcis at the inner border of the long plantar ligament, crossing the outer head of the normal accessorius muscle, and inserted into the peroneal sesamoid, thus taking the course of the tendon of the anomalous muscle.

Mr T. W. P. Lawrence exhibited *Two Hearts with Abnormal Valves* (figures of which accompany this note). In one the pulmonary valve presented only two semilunar flaps, and in the other a similar abnormality was present in the aortic valve.

In the two specimens the semilunar flaps are sufficiently free from disease to permit of the exclusion of a pathological blending of adjacent fully-developed flaps as the cause of the anomaly. In the case of the pulmonary valve the segments are wholly free from disease; in that of the aortic valve the line of attachment to the wall of the vessel presents a slight thickening, a small atheromatous nodule is seated near each point of junction of the flaps, and from these masses induration has extended partially through the segments. In both specimens the heart is in other respects normally developed.

The segments of the abnormal pulmonary valve (fig. 1) are equal in

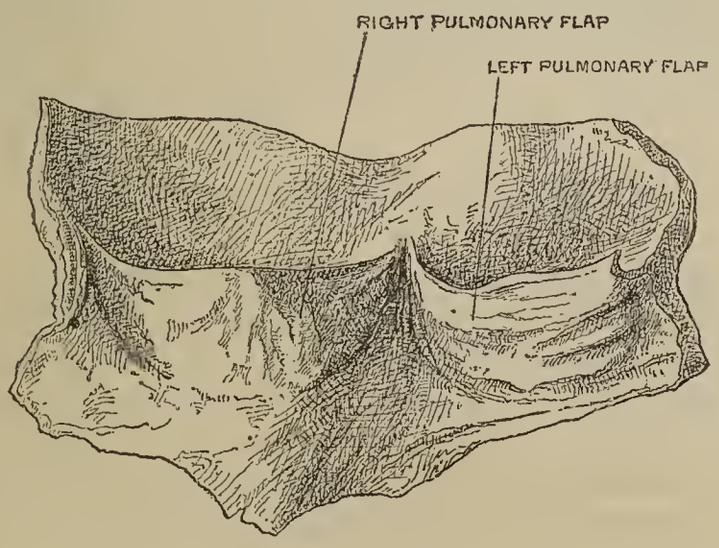


Fig. 1.—Pulmonary valve.

size, their free margins are even and present no notch or other irregularity. Their convex surface is not marked by any vertical groove, nor is there any central line of thickening, either in the substance of the flaps or upon the opposite arterial wall, such as is seen in examples of fusion of adjacent segments. Excepting their increase in size and extent of attachment, they present the characters of normal valve segments. Of the points of junction of the two segments the posterior, or that lying towards the aortic orifice, has the normal situation on the wall of the artery; that is to say, it is opposite the junction of the anterior with the left posterior aortic flaps. The other point of junction of the pulmonary segments has a

diametrically opposite position on the wall of the artery, and corresponds, therefore, to the mid-point of a sinus of Valsalva in a normally formed valve. The two segments of the aortic valve (fig. 2) are, as before mentioned, slightly deformed by atheroma and induration ; but the morbid changes are not such as will account for the abnormality. The two flaps are distinct, each has its normal semilunar form, and in neither of them is there any evidence of the fusion of two segments. There is an inequality in the size of the segments, the anterior or right being rather larger than the posterior or left, the latter corresponding with, although somewhat larger than, the left

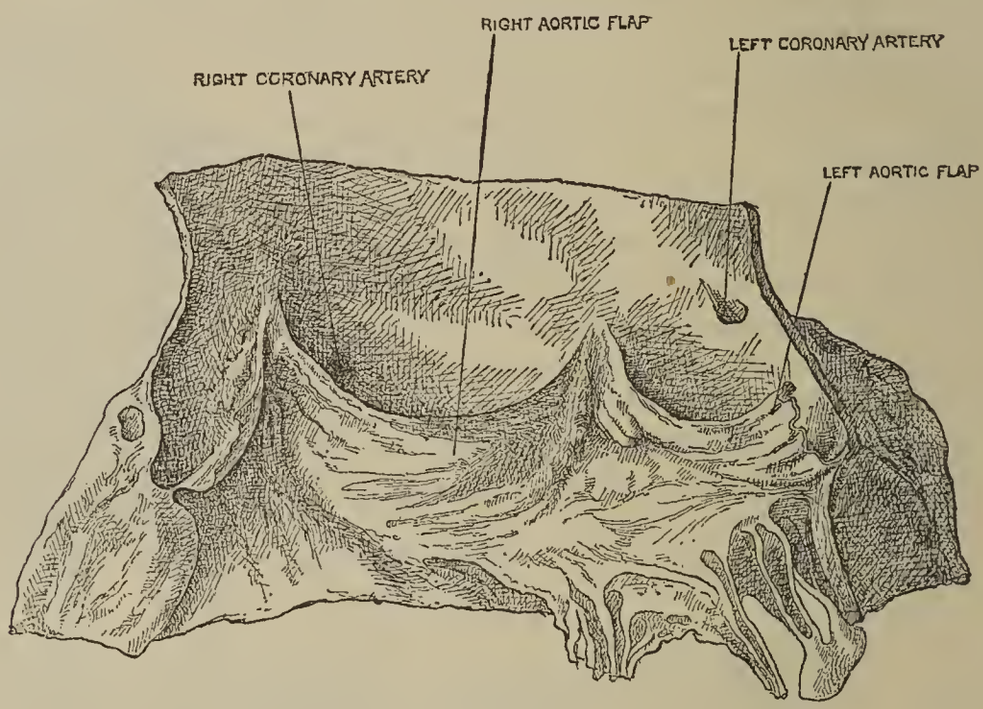


Fig. 2.—Aortic valve.

posterior flap of a normal valve, and the left coronary artery springs from the middle of the corresponding sinus of Valsalva. The anterior point of junction of the two segments lies in its normal position opposite the junction of the posterior with the right anterior flap of the pulmonary valve. The right coronary artery arises from the larger sinus, and from its anterior third ; and in front of the situation of the junction of the anterior and right posterior segments when these are differentiated—a spot which may be localised without regard to the valve segments, since it is situated immediately superior to the pars membranacea of the septum ventriculorum. In the specimen the pars membranacea is within the larger pouch forming part of the outer or arterial wall, and its position in the figure is just below the end of the line pointing to the right aortic flap.

The explanation of these valvular anomalies is to be sought for in that period of embryonic development in which the aortic bulb is transformed into aorta and pulmonary artery. At the commencement of this process the undivided bulbus arteriosus develops, in connection with its inner or endothelial tube, four linear and vertical thickenings, which protrude as semi-cylinders into the lumen. Two of these thickenings on opposite sides of the tube are larger than the

remaining two. Their most prominent parts subsequently touch and fuse, and through their median planes and line of contact the division of the bulb takes place, producing two tubes, each of which contains one entire endothelial cushion and two half cushions. From these cushions the semilunar flaps are developed.

Of the two specimens the abnormality of the pulmonary valve is to be explained by assuming the suppression of the left anterior cushion, the remaining two half cushions developing into two equal flaps. The inequality in the size, and the special relations of the aortic segments in the second specimen prevent the explanation of the defect by an analogous suppression of the right posterior aortic cushion; and the condition of this valve is best accounted for by supposing that the anterior and right posterior aortic cushions have developed into a single flap.

Dr H. D. Rolleston showed a specimen in which there was a rudimentary valve segment between the right and posterior pulmonary valves. This additional fourth segment was rather below the level of the other three valves. Both it and the other valves were fenestrated.

The President then read a paper on the *Relations of the Dentary Arcades in the Crania of Australian Aborigines*, which will be found at vol. xxv. p. 461, of the *Journal of Anatomy and Physiology*.

Professor Thane, Mr Bland Sutton, and Dr W. Hill spoke upon the subject.

The Secretary, for Professor Cleland, then read the following paper:—

On Burial in Sand for Preparation of Bones.

"Some years ago, when looking at a skeleton of a seal which was in preparation at Professor M'Intosh's Marine Laboratory at St Andrews, I happened to remark on the presence of some oil in one of the bones, when the attendant replied—'That will give me little trouble; I shall put it in the sand for a while.' I then remembered what every one must have noticed—namely, how free from oil bones by the sea-shore are; and it occurred to me for the first time, how absurd it was to suppose that a cleansing which was carried to the heart of the bone could be effected by sand lice. I concluded that it was most probable that every time that the tide ebbed, the water in the sand exercised a dragging force as it was carried down, and that the interior of a bone could not be exempted from this, but would be exposed to a prolonged and regularly applied slow influence tending to draw materials from its interior. It was impossible to be certain without experiment that the sea-water did not in some other way favour the removal of oil, and, even if my supposition were true, it had yet to be taken into consideration that sea-water was heavier than fresh. But when I came back to Glasgow I had a cartload of sand deposited in a paved

court, and proceeded to test the influence of burial in sand with exposure to the rain. The bones of a fine zebra and a large kangaroo, with the larger masses of muscle roughly removed, were buried in summer in the sand heap, and emerged in the following spring beautifully clean and as free from oil as could be desired. They caused no bad smell in the court, and when they were taken out required only to have the sand washed off them and to be dried to be ready for articulating. Afterwards I buried, with the skin on, a young polar bear, which came at an inconvenient time and in an offensive condition. But a winter was not sufficient to make it ready, obviously because the skin prevented the freedom of currents, but I put in a number of human bones which had got so frightfully greasy lying for years in drawers that they were quite unfit for exhibition, and they emerged after a time thoroughly clean, and I was so pleased with the result that I treated in the same way a whole skeleton which had been articulated several years before for the purpose of showing old-age peculiarities, and had got so greasy that it had been put away, and had narrowly escaped being sent to the churchyard. The result in this instance was very remarkable. The light porous bones of old age are exhibited without a trace of oil left in them. The sandheap has never been in the least offensive. The products of putrefaction appear to soak away gradually to the drains. I notice that when there are copious remains buried in it, it becomes the resort of innumerable springtails, but these are no more capable of cleaning bones to the heart than are the sand lice by the sea-shore.

"The importance of sand burial as a means of preparing bones depends not merely on its being one of many methods by which recent specimens may be properly prepared, but as being the most effective way of purifying old specimens from oil, and still more as being greatly superior to maceration for specimens which have been obtained from dissecting-rooms in which strong preservations are used. Remains from the rooms in this school are accordingly difficult to macerate, but they come from the sand heap white in colour, and with the spicules of the cancellated tissue thoroughly clean."

Dr Herbert Spencer then read a paper on *Ossification in the Head of the Humerus at Birth*, which will be found at vol. xxv. p. 552, of the *Journal of Anatomy and Physiology*.

Dr Wardrop Griffith then read a paper on a case of *Congenital Malformation of the Heart with Transposition of the Viscera*, which will be printed in a subsequent number of the *Journal of Anatomy and Physiology*.

Professor Thane, Mr Bland Sutton, Dr Herbert Spencer, and Dr Rolleston spoke upon the subject, and Dr Wardrop Griffith replied.

Mr C. B. Lockwood and Dr H. D. Rolleston then read a paper on the *Situation of the Vermiform Appendix*, and showed illustrative

specimens. The following is an abstract of their results, which later will be published in greater detail :—

Notes of the Position and Condition of the Vermiform Appendix in 100 *consecutive Cases in which there was no manifest Morbid Condition of the Abdominal Cavity.*

There were 61 male and 39 female subjects. The ages varied from 13 weeks to 70 years.

Normal Conditions.—When pervious or perfectly free, with a mesentery allowing it to be moved in all directions, the appendix was considered to be normal. (1) In many cases it lay under the inferior layer of the mesentery, and directed towards the spleen. (2) In many other cases it lay on or over the brim of the pelvis. These were the two most frequent positions, and it seems a matter of chance which is found, as it can easily be shifted from one to the other. It may also lie (3) over the cæcum and ascending colon, (4) to the right of the cæcum and ascending colon, or (5) under the cæcum.

In the 39 female cases the normal condition was noted 26 times giving a percentage of 66·6.

In the 61 male cases the condition occurred 32 times, or 52·6 per cent.

In nine other cases the appendix, though free, was found to be obliterated—five times in males, four times in females.

In six of the cases for its whole extent, in the other three cases partially only.

Abnormal positions of the appendix may be considered as being caused (1) by deficiency of its mesentery, which results in the vermiform appendix being fixed to the peritoneum; (2) by the existence of pouches of peritoneum such as the ileo-cæcal or sub-cæcal fossæ, which may contain the free appendix; (3) by a combination of these two factors resulting in the vermiform appendix being curled up in and adherent to the wall of a peritoneal pouch.

The abnormal positions may be classified as cases in which the appendix is—

(1) Adherent to the peritoneum in the region of the sub-cæcal fossa, that fossa not being present. Noted 4 times—3 in males, 1 in females.

(2) Adherent to the under surface of the cæcum. Noted 4 times—2 in males, 2 in females.

(3) Coiled up in sub-cæcal pouch. Noted 10 times—8 in males, 2 in females.

(4) Fixed to peritoneum along the right border of cæcum and colon, the tip often being free. Noted 4 times—3 in males, 1 in females.

(5) Fixed to peritoneum in region of the ileo-cæcal fossa, that pouch not being developed. Noted 4 times—all in male subjects.

(6) Coiled up in ileo-cæcal pouch. Noted 5 times—2 in females, 3 in males.

(7) Hidden completely in pouch the mouth of which has become closed. Noted 2 times—both in males.

Summary.

Vermiform appendix, free, movable, pervious, . .	58
,, obliterated, . . .	6
,, partially obliterated, .	3
Abnormal positions, adhesions, hernias, &c.—	
(1) In sub-cæcal region adherent to peritoneum,	4
(2) Adherent to under surface of cæcum, .	4
(3) In sub-cæcal pouch, ...	10
(4) Fixed to right of cæcum, ...	4
(5) In ileo-cæcal region adherent to peritoneum,	4
(6) Coiled up in ileo-cæcal pouch, . . .	5
(7) Hidden completely, ...	2
	100

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PROCEEDINGS OF THE ANATOMICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

NOVEMBER 1891.

The Fifth Annual General Meeting of the Society was held on Monday, November 23, in the Library of St Bartholomew's Hospital Medical School. Present—Sir Wm. Turner (President) in the chair, and fifty-six members and visitors.

The Minutes of the previous Meeting were read and confirmed. The following gentlemen were elected officers for the ensuing year :—*President*—Sir Wm. Turner, F.R.S. *Vice-Presidents*—John Curnow, M.D. ; Alexander Macalister, F.R.S. ; Peter Redfern, M.D. *Treasurer*—G. B. Howes. *Secretaries*—Ambrose Birmingham, M.D. (Ireland) ; J. Yule Mackay, M.D. (Scotland) ; George Henry Makins (England). *Council* — Wm. Anderson, Stanley Boyd, W. H. Bennett, D. J. Cunningham, F.R.S. ; John Cleland, F.R.S ; Wardrop Griffith, M.D. ; W. P. Herringham, M.D. ; Alexander Hill, M.D. ; Robert Howden, C. B. Lockwood, Clement Lucas, A. M. Paterson, R. W. Reid, Charles Stewart, J. Bland Sutton, Johnson Symington, G. D. Thane, Arthur Thomson, Bertram Windle, Alfred H. Young.

Mr Edward Fawcett, M.B., C.M., was elected a Member of the Society.

The following gentlemen were nominated for election at the next meeting :—T. Manners-Smith, B.A. Cantab, M.R.C.S., Demonstrator of Anatomy at Queen's College, Birmingham, proposed by B. C. A. Windle, Alexander Macalister, Alexander Hill ; and H. B. Robinson, M.D., M.S., London, Demonstrator of Anatomy at St. Thomas's Hospital Medical School, proposed by G. H. Makins, Wm. Anderson, and F. G. Parsons.

The Treasurer's Report, showing a balance of £57, 5s. 2d. in favour of the Society, was received and adopted.

Professor Anderson Stuart showed a stuffed head of the *Bell Pig* of New South Wales.

Mr C. B. Lockwood showed a *Persistent Müllerian Duct.*

The specimen had been obtained by Dr Ormerod from the body of a *man*, aged 38, who had died of disease of the aortic valves. The following is a brief note of the specimen, which will be supplemented when the examination is completed. Both kidneys and ureters were normal, but in the hilum of the right kidney there was a pyriform structure, which looked like a second pelvis, bending downwards into

a cord, which looked like a second ureter. This resemblance was increased by the fact that the cord ran downwards, parallel to the true ureter, and was like it in size and structure. However, this adventitious cord left the ureter as they approached the iliac fossa, and ran inwards to join the vas deferens as it emerged from the internal abdominal ring. The joining together of the two cords was complete, and the single cord which they formed took the usual course of the vas deferens, to end in the manner usual to that duct. Assuming that the abnormal structure was a persistent Müllerian duct, which had failed to descend with the epididymis and body of the testis, it is evident that the hydatid of Morgagni, which is the remains of the upper end of Müller's duct, ought to have been wanting in the side which the persistent duct occupied, namely, the right. This was so, although the left hydatid of Morgagni was well developed.

The pyriform portion of this persistent Müllerian duct was hollow, and contained a cavity as big as the pelvis of the kidney, but it possessed neither ostium or fimbriæ. From the dilatation a probe could be passed downward almost to the junction with the vas deferens. The utriculus hominis was of the usual size and appearance.

It is proposed to make a further report upon this specimen after a histological examination has been made.

Professor Anderson Stuart showed a *working Model of a Horizontal Section of the Eye.* He then demonstrated—

1. A *Ring-like Network of Fibrous-looking Tissue in the Ciliary Region of the Vitreous Humour of the Normal Eye.* The tissue is in the form of a membranous network, the dominant lines of which, as seen in sections, are attached to the bounding membrane of the vitreous, just in front of the anterior margin of the true retina. From this attachment they extend backwards and inwards towards the axis of the eye-ball into the vitreous substance. There were shown preparations of the region in the form of a ring, which had been mechanically isolated from the human eye, and sections under the microscope. This account of the intimate structure of the region thus differs greatly from the one usually given.

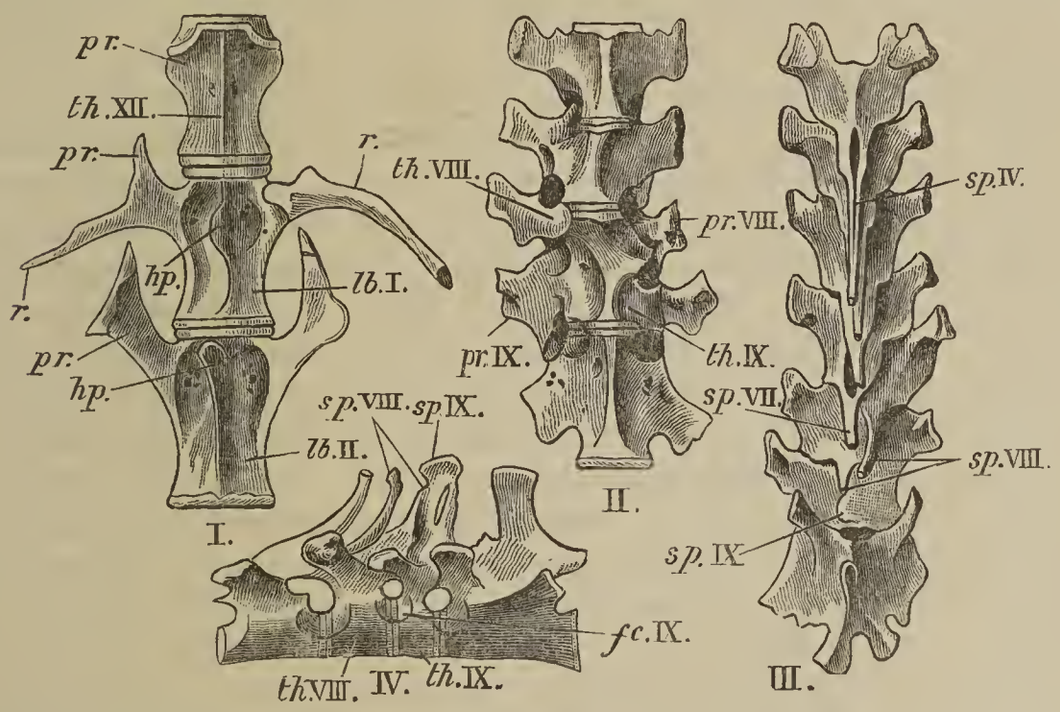
2. A new preparation of the *Membrane in front of the Vitreous*, lining the fossa patellaris, and forming the posterior wall of the canal of Petit, which is thus a true canal. The membrane is described in the *Proceedings of the Royal Society*, 1891. The preparation shown was in some respects more satisfactory than the earlier ones.

Professor Alex. Macalister showed a series of abnormalities, obtained from the anatomical department at Cambridge.

Professor G. B. Howes exhibited a *Rabbit's Backbone having a free Lumbar Rib*, and made the following remarks thereon. As the Rabbit is one of those quadrupedal mammals having the same cervico-thoracic vertebral formula as man, the presence in it of a free rib in articulation upon the first lumbar vertebra is of general interest, in view of Rosenberg's discovery[1] that a similar rib is

[1] *Morph. Jahrb.*, Bd. i. pp. 86, *et seq.*

represented in cartilage in the early human fœtus. In the specimen exhibited, the free rib was present only on the left side (*r*, fig. *1*); it measured ¾ of an inch in length, and was diverted backwards and downwards; a definite facet for its articulation was developed upon the antero-lateral border of its related vertebra, the lower lamina of the transverse process of which was reduced. It entered into the composition of the thoracic wall, and had, in all respects, the characteristic relationships of a normal posterior thoracic rib. The lower lamina of the transverse process of the opposite side (fig. *1*) was fully developed but abnormal, in respect to the prolongation of its posterior border into an immovable spur of bone, having a similar disposition to the free lumbar rib. On comparison with the



i., the last thoracic and two first lumbar vertebræ, ventral aspect; ii., the thoracic vertebræ, numbering six to ten, ventral aspect; iii., the thoracic vertebræ, numbering four to ten, dorsal aspect; iv., the thoracic vertebræ, numbering seven to ten, left lateral aspect; *c.*, centrum; *fc.*, capitular facet; *pr.*, transverse process; *r*, lumbar rib. All natural size.

normal vertebra, this spur might at first sight appear to represent the epiphysial outer extremity of the transverse process (which is variable in its extent and mode of ossification), and to suggest that that structure might represent a vestigial rib. Further comparison with the posterior thoracic vertebral segments was, however, fatal to any such supposition, and it showed, unmistakably, that while the spur in question undoubtedly represented a lumbar rib, its ankylosis with the adjacent transverse process was the direct outcome of the non-reduction of that structure. It had, indeed, suffered (except for its greater increase in length) substantially that change described by Rosenberg [1] as normal for the human subject.

The special interest of the specimen lay, however, in the rationale of existence of the free lumbar rib itself. The animal from which it was obtained was, so far as could be determined, normal and healthy, except for an abnormality involving the 8th and 9th thoracic

[1] For a discussion, with extension, of this author's conclusions, see Birmingham *Jour. Anat. and Phys.*, vol. xxv. p. 526.

vertebræ (figs. ii., iii., iv.). The ossific halves of the centre of these had failed to unite in the customary manner, an oblique fusion having been established between the right half of the 8th and the left half of the 9th. On examining the specimen from beneath (fig. ii.), the free half of the 9th vertebra was seen to have remained undisturbed, while that of the 8th had been carried forwards, with marked indications of atrophy, as the result of domination by forward extension of the ankylosed (right) half of the 9th. There could be no doubt that the condition of the parts was directly due to the failure of the two halves of the centre to unite; and the specimen lent considerable support to the belief in the morphologically double nature of the vertebral centrum, originally advanced by Johannes Müller,[1] Von Baer, and Rathke,[2] and recently substantiated by Rosenberg[3] and Foriep[4] in their discovery of the paired nature of its 'Anlage.'[5] The total area of the body occupied by the metamorphosed 8th and 9th vertebræ with their associated skeletal and muscular apparatus was little, if at all, in excess of that normal to a single posterior thoracic segment; and, as the joint result of this retardation in growth and the deformity of the parts related to the two vertebral segments named, the thoracic box of the animal must have been placed at a mechanical disadvantage. When this is borne in mind, the facts concerning the free lumbar rib already alluded to fully justify the conclusion that nature had, so to speak, fallen back upon that structure in seeking to make good the deficiency, pretty much as she calls in the aid of the outstanding episkeletal muscles during forced respiration. Professor Howes had examined some scores of Rabbits' skeletons, and had found only one (in addition to that exhibited) possessed of undoubted lumbar ribs. They were borne upon the 1st lumbar vertebra; and, inasmuch as the thoracic skeleton of the animal possessed of them was deformed, he inclined to the belief that these observations justify us in arguing, by analogy, that the clue to the appearance of a free lumbar rib in a mammal having an otherwise normal backbone and costal skeleton is to be sought in a functional inefficiency of some one or more of the non-skeletal parts active during normal respiration.

On viewing the abnormal parts of the specimen exhibited from the dorsal and lateral aspects (figs. *3 and 4*), the left arch of the right vertebra was seen to have alone approximated towards the normal proportions. In attempting to realise them it had become ankylosed to the corresponding arch behind. The remaining portions of the arches of the two vertebræ involved had undergone a retardation in growth, and one conspicuous result of the inequality of this had been the forcible divarication of the two halves of the eighth neural

[1] *Handbook of Physiol.*, English translation, p. 1613.
[2] *Cf.* Robin, *Journ. d. l'Anat. et Phys.*, t. 1, 1864, p. 276.
[3] *Loc. cit.*, p. 131.
[4] *Archiv f. Anat. et Phys., Anat. Abth.* 1886, pp. 125–127.
[5] For interesting information bearing upon both the morphological and pathological aspects of this subject see (α) Sir Geo. Humphry's work, *The Human Skeleton*, pp. 123, 124; (β) Willett and Walsham in *Trans. Medico-Chirurg. Soc.*, vol. lxiii. pp. 257–301; and (γ) Bland Sutton in these *Proceedings* for April 1890, and *Trans. Path. Soc.*, vol. xli. p. 341.

spine. The neural arches of the 9th vertebra had ankylosed while the halves of its spine were in the very act of becoming separated. The seven anterior thoracic spines bore marked traces of the effects of the disruption in the form of a fenestration (fig. *3*), which, while testifying to the morphologically paired nature of the spines themselves, showed the mechanical effects of the abnormality to have been transmitted from segment to segment in a manner as obvious as it was suggestive.

Professor Anderson Stuart commented upon the *Tubercle situated on the Posterior Border of the Great Trochanter of the Human Femur* ("*Tubercle of the Quadratus*," Thane), pointing out that it corresponded to the line of junction of the epiphysis of the great trochanter with the shaft.

Messrs W. G. Lee and C. P. White showed a body containing the following abnormalities :—*a*, *accessory digastric.*

On both sides there is a slip of muscle arising by muscular and tendinous fibres from the posterior belly of the digastric muscle just as it is becoming tendinous ; the slip passes downwards and forwards, and is inserted into the fascia connecting the hyoid bone with the digastric, and also by a distinct tendon into the anterior belly of the digastric (deep surface of). Its nerve comes from the hypoglossal close to the nerve to the thyro-hyoid. On the right side this nerve-branch was examined microscopically, and found to be true nerve. The innervation of the digastric and stylo-hyoid is normal. The artery to the slip comes from the hyoid branch of the lingual. On the right side the stylo-hyoid does not split, but passes completely in front of the digastric ; on the left side it is normal.

b, In the same body the *levator glandulæ thyroideæ* is segmented off from the crico-thyroid muscle, and not from the infra-hyoid muscles as usually described. It arises from the lower border of the thyroid, and inferior tubercle of the oblique line on the right side, crosses the cricoid cartilage obliquely, and is attached to the sheath of the left lobe of the thyroid body. Its nerve comes from the external laryngeal. The pyramid is present on the right side.

Dr Herringham showed an *abnormality of the first part of the small intestine.* The vertical part of the duodenum ended in the transverse at the normal place on the right side of the 3rd lumbar vertebra. The transverse part ran almost horizontally across the spine to the left side of the same vertebra. It here turned downwards, passed behind the descending layer of the transverse mesocolon, and ended in the jejunum. The first 9 inches of the jejunum, instead of having a free mesentery, lay wholly behind the peritoneum. For the first $1\frac{1}{2}$ inch it ran downwards upon the side of the body of the 4th lumbar vertebra ; for the next 5 inches it ran obliquely downwards and to the right, covering the disc between the 4th and 5th lumbar vertebræ. It turned on the outer border of the psoas, and ran upwards to the level of the transverse mesocolon, behind which it lay in contact with the duodenum. It then passed forwards, and received a free mesentery.

The Second Annual Report of the Collective Investigation Committee[1] was laid upon the table. Professor Thane proposed a vote of thanks to Mr Arthur Thomson for the labour and care he had bestowed upon the Report. He was glad to find that the results confirmed current views, showing, for instance, that the most usual arrangements were those which, in the last edition of *Quain's Anatomy*, he had already chosen for types. Professor Alex. Macalister seconded the vote of thanks, and brought forward the following Appendix :—

Appendix to the Second Annual Report of the Collective Investigation Committee.

Owing to the exceptional disturbance in our Anatomical Department, due to our removal to the New Buildings in Cambridge and to inadvertence on the part of some of my subordinates, the notes of the observations were so very irregularly kept that I have been unable to reconstruct tables comparable with those sent in from the other schools.

In regard to the first, or the branches of the thyroid axis, I find notes of thirty-nine bodies, which in percentage so substantially agree with those in the Report that it is not necessary to add them. There were, however, two remarkable cases worthy of note. In one instance the cervicalis ascendens artery was very large, and, ascending to the back of the scalp, replaced the third stage of the occipital artery, which was otherwise non-existent.

In another instance, a separate inferior thyroid artery arose from the right subclavian before the origin of the right vertebral. In four instances a thyroidea-ima coexisted with the normal inferior thyroid—a condition which seems unrepresented in the returns.

The only condition which was carefully sought for, and of which the notes have been kept, are those regarding the arrangement of the ileum and cæcum and the occurrence of a diverticulum. I have now notes of 395 bodies in this respect, and have found three examples in this number, making its percentage of occurrence ·76.

Several specimens from St Bartholomew's Hospital Museum were on view before and after the meeting.

The meeting then adjourned.

The Committee of Management desire to point out, apropos of the balance accruing from the recovery of subscriptions in arrear, that the Society is now in a position to more fully illustrate its proceedings, and also to perform some additional service to its members. A movement is on foot towards assisting in the preparation of an analytical index to the back numbers of the *Journal of Anatomy and Physiology*, and the Committee hope soon to be able to report more fully upon the same.

[1] See *Jour. of Anat. and Phys.*, July 1891.

SECOND ANNUAL REPORT OF THE COMMITTEE OF COLLECTIVE INVESTIGATION OF THE ANATOMICAL SOCIETY OF GREAT BRITAIN AND IRELAND FOR THE YEAR 1890–91.[1] Reported by

ARTHUR THOMSON, M.A., M.B., *Lecturer on Anatomy, University of Oxford.*

THE following questions were issued by the Committee of Collective Investigation of the Anatomical Society early in October 1890:—

1. Mode of origin of the following vessels, usually described as branches of the thyroid axis, viz., inferior thyroid, suprascapular, ascending cervical, and transverse cervical arteries.
2. Mode of distribution of the last dorsal and first lumbar nerves.
3. To note in each subject the distance of the lower margin of the kidney on each side from the iliac crest. The sex of the subject to be stated, and any naked-eye evidence of disease of the organs to be recorded.
4. The distribution of the cutaneous nerves on the dorsum of the foot and toes.
5. To note the occurrence of a diverticulum ilei (Meckel's), in each case giving details of its position and connections. It is particularly requested that the number of subjects examined be recorded, whether the diverticulum be present or no.

The returns have been most gratifying in point of numbers, and are a decided improvement on last year's Report. Twenty of the thirty-nine institutions to which notices were sent have participated in the scheme and have returned answers to some, if not to all, the questions. The Universities and the larger provincial schools are now well represented, and as the material at their command is extensive, their co-operation greatly enhances the value of the report.

[1] The First Report appeared in the *Journal of Anatomy and Physiology*, October 1890.

In three instances schools which sent in returns last year have taken no share in the present report.

Subjoined is a list of the schools to which notices were sent. An asterisk is placed opposite those from which returns have been received:—

St Bartholomew's Hospital, London.
*Charing Cross Hospital, London.
*St George's Hospital, London.
Guy's Hospital, London.
King's College, London.
London Hospital, London.
*St Mary's Hospital, London.
*Middlesex Hospital, London.
St Thomas' Hospital, London.
*University College, London.
*Westminster Hospital, London.
*London School of Medicine for Women.
Cook's School of Anatomy.
*University of Oxford.
University of Cambridge.
*Queen's College, Birmingham.
*Bristol Medical School.
*School of Medicine, Yorkshire College, Leeds.
*School of Medicine, University College, Liverpool.
*The Owens College, Manchester.
Medical School, Firth College, Sheffield.
*University of Durham School of Medicine, Newcastle-on-Tyne.
*University of Edinburgh.
School of Medicine, Royal College of Surgeons, Edinburgh.
*School of Medicine, Minto House, Edinburgh.
University College, Dundee.
School of Medicine for Women, Edinburgh.
*University of Aberdeen.
*University of Glasgow.
Anderson College, Glasgow.
St Mungo's College, Glasgow.
Western Medical School, Glasgow.
*School of Physic, Trinity College, Dublin.
Carmichael School of Medicine, Dublin.
*Catholic University School of Medicine, Dublin.
Royal College of Surgeons, Ireland.
Queen's College, Belfast.
Queen's College, Cork.
Queen's College, Galway.

REPORT.

Question I.

A large number of replies to the question on the branches of the thyroid axis have been sent in, and the Committee heartily thank the following gentlemen for their assistance:—

Messrs James Musgrove, University of Edinburgh; Gordon Brodie, Middlesex Hospital, London; C. Devereux Marshall, University College, London; J. J. Long, Trinity College, Dublin; P. R. W. Santi, School of Medicine, Newcastle-on-Tyne; J. Symington, Minto House, Edinburgh; W. Thelwall Thomas, University College, Liverpool; J. A. H. White, Queen's College, Birmingham; Edward Fawcett, Yorkshire College, Leeds; —— ——, St Mary's Hospital, London;

A. Robinson and J. B. Carter, The Owens College, Manchester; James Black, Westminster Hospital, London; Hugh Sutherland, University of Aberdeen; P. Brady and J. Dunne, Catholic University School of Medicine, Dublin; A. Thomson, University of Oxford; Misses Piercy and Bate, London School of Medicine for Women.

It has been found somewhat difficult to summarise the results obtained. It was felt that minute descriptions of the various anomalies met with would convey but a poor impression of the arrangement of the various vessels; on the whole, it appeared best to tabulate the results in a graphic manner (see Tables I. and II.). In Table I., we have the nine most common modes of arrangement, placed in order according to their frequency. The figures on the table indicate the number of cases recorded out of a total of 544, and subjoined is also the percentage of occurrence of each type, the types being lettered A, B, C, &c., for convenience of reference; where types are more or less allied, then the figures are lettered thus—P^1, P^2, P^3 (Table II.).

In Table II. we have twenty-seven modes of arrangement figured; as they are not so frequently met with, they have been printed off on a reduced scale. The numbers of their occurrence out of the total of 544 cases examined only has been given. The percentage of frequency has been omitted.

It may be said here that an effort has been made to restrict as far as possible the number of types, and the slighter variations have been, when possible, included under what may be termed the more common type. Again, latitude has been allowed in reference to the exact points of origin of the aberrant arteries, *i.e.*, whether they arise from the II. or III. parts of the subclavian. On the whole, however, the tables will be found to represent fairly accurately the numerous variations observed in the course of this investigation.

The various arteries are lettered as follows:—Inferior thyroid, I.T.; ascending cervical, A.C.; transverse cervical, T.C.; suprascapular, S.S.; superficial cervical, S.C.; posterior scapular, P.S.; internal mammary, I.M.; vertebral, V.

As far as possible only those branches of the subclavian which are usually offsets of the thyroid axis are represented in the figure, as the enumeration of other details might tend to obscure the results desired. As to the relative frequency of variations on the right and left sides of the neck, the results obtained are not such as to enable us to draw any definite conclusions; indeed, there appears to be no greater tendency for the occurrence of these varieties on one side more than the other.

Dr Robinson, of The Owens College, Manchester, describes a case in which the posterior scapular artery arose as a branch from the superior intercostal, and Mr P. Brady and Mr J. Dunne record a case, in the report from the Catholic University Medical School, Dublin, wherein the inferior thyroid, which was a branch of the thyroid axis, was double, the two trunks embracing the common carotid artery.

No attempt has been made to classify the different arteries according to the sources from which they arise. Should this be desirable, the means for doing so are readily accessible in Tables I. and II.

TABLE I.—*Variations in the Branches of the Thyroid Axis. Total number examined* 544.

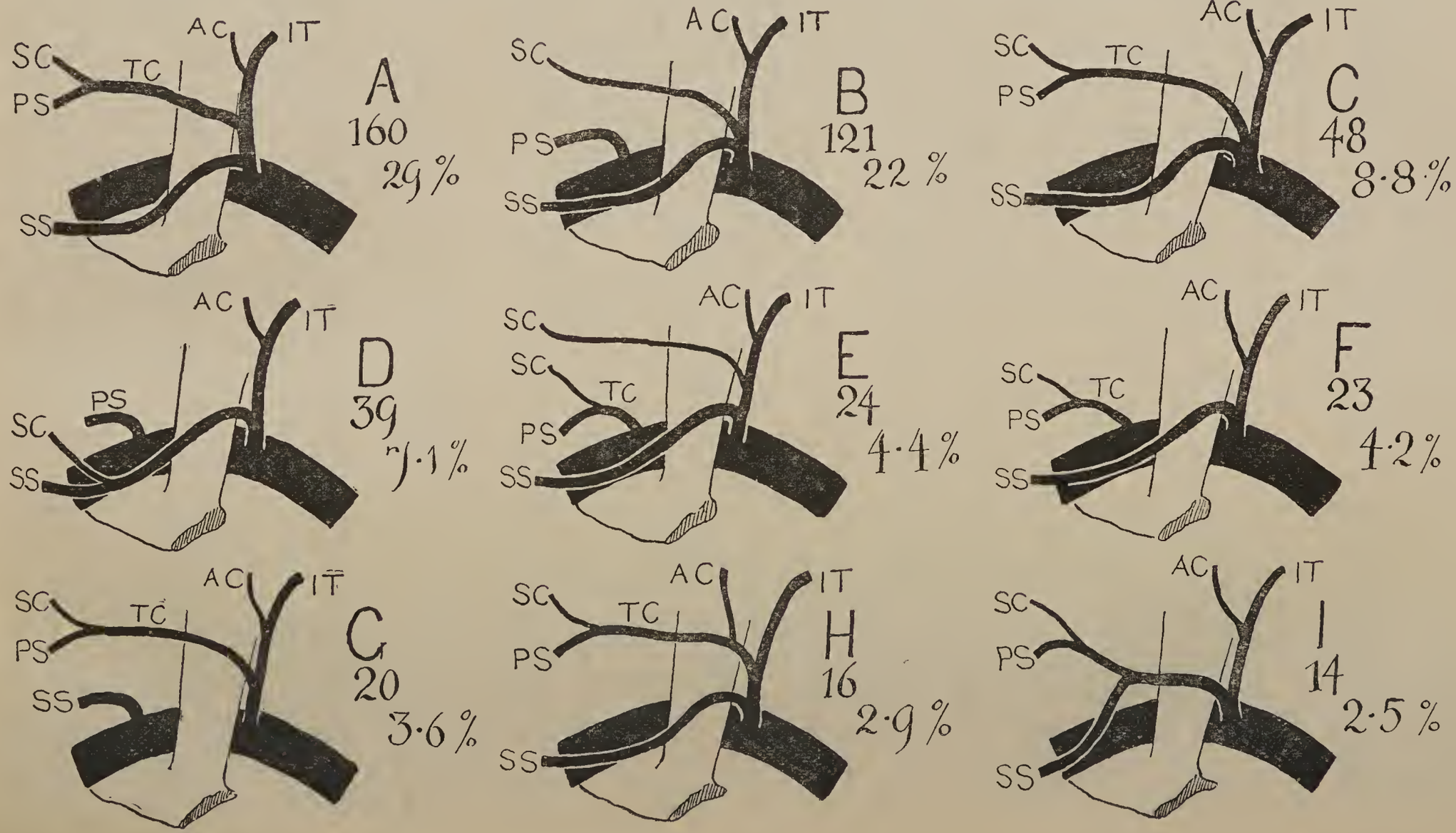


TABLE II.—*Variations in the Branches of the Thyroid Axis.*
Total number examined 544.

Question II.

The replies to this question, on the distribution of the last dorsal and first lumbar nerves, are few in number. This is readily explained, for to have answered fully would have necessitated a very careful supervision of the dissections at various stages, and several teachers have written to the secretary regretting that they have had to abandon the investigation owing to the uncertain and unsatisfactory nature of the results obtained by their assistants.

The following sent in reports:—Messrs Montague Griffin, Trinity College, Dublin; Walter Chapman, Queen's College, Birmingham; Gordon Brodie, Middlesex Hospital, London. The Misses Piercy and Bale, London School of Medicine for Women.

In arranging the facts observed, the variations only are noticed in the following summary, accepting as normal that arrangement which is described in the standard English text-books.

Eighty-three subjects have been examined, and details thought worthy of note by the various observers are enumerated in the subjoined report.

Mr Montague Griffin in this connection sends an interesting note in regard to the nerve supply of the pyramidalis:—"I have been able," writes he, "to verify the nerve supply of this muscle in only seven cases. In others, where the nerve had been found, previous dissection had destroyed its connections. When found it was always by the adoption of one method. The sheath of the muscle was opened, the apex detached from the linea alba, and the muscle reflected downwards, carefully looking for any filament of nerve entering its posterior surface. The first nerve which was seen entering its posterior surface was proved, on tracing it outward, to arise on each side from the ilio-hypogastric; it passed inwards on both sides beneath the pillars of the ring. The remaining six nerves observed supplying the muscle came from the last dorsal nerve. The nerve pierces the substance of the rectus muscle about the middle of the posterior surface of the pyramidalis. The last nerve supply which I found would, I thought, have verified the condition which Ellis describes as the normal. A nerve filament passed up out of the inguinal canal, seemingly from the ilio-inguinal nerve, and passing beneath the pillars of the ring entered the posterior surface of the muscle. However, further examination of this subject proved that this was the case where the last dorsal nerve played the part of the ilio-inguinal—it would seem as if, having gone on another man's errand in supplying the inguinal region, it recollected itself and sent back a twig to perform what *seems* to be one of its normal duties—the nerve supply of the pyramidalis."

Summary of Variations met with in the Origin and Distribution of the Last Dorsal and First Lumbar Nerves.

XII. Dorsal Nerve. *Anterior primary division absent* in one case—replaced by a branch from I. lumbar, which likewise furnishes ilio-hypogastric and ilio-inguinal.

Do. do. *Iliac branch absent* in five cases—replaced by iliac branch of ilio-hypogastric.

Dorsi-Lumbar Nerve present in five out of 6 subjects examined.

Communicating Branches between XII. Dorsal and I. Lumbar nerves in the abdominal wall present in two out of seven subjects examined (Queen's College, Birmingham) and in many (number not stated) cases from Trinity College, Dublin.

I. Lumbar Nerve—

Ilio-hypogastric absent in two cases—replaced by the ilio-inguinal, which in both cases took a course similar to the external cutaneous across the iliac fossa, subsequent to which in one case its distribution was normal, in the other instance it furnished an external cutaneous nerve to the thigh.

Ilio-hypogastric (*Iliac branch*) *absent* in thirteen cases—replaced by iliac branch of XII. dorsal.

According to Mr Montague Griffin, B.A., Dublin, the iliac branch of ilio-hypogastric pierced the internal oblique immediately after its origin, and then lay for some distance between the internal and external oblique muscles previous to piercing the latter, whilst in this position it forms communications with the XII. dorsal. In the gluteal region it formed a network of communications with the external cutaneous branches of the posterior primary divisions of the lumbar nerves, and in all cases supplied the region of the tensor fasciæ femoris muscle by means of a special branch.

Ilio-hypogastric (*Hypogastric branch*) usually became cutaneous 2 to $2\frac{1}{2}$ inches above level of the pubis; in one case it appeared 4 inches above that level.

Ilio-hypogastric and ilio-inguinal in 9 subjects arose by a conjoint trunk.

Ilio-inguinal arose in one case from II. lumbar nerve.

Do. *absent* in two cases. In one replaced by XII. dorsal, in the other by genital branch of genito-crural.

Do. reciprocal in point of development with ilio-hypogastric.

Muscular Nerves—

Muscular branches were noticed in one case coming off from the ilio-hypogastric and ilio-inguinal to supply the muscles of the abdominal wall.

A muscular branch in one case arose from the hypogastric branch of the ilio-hypogastric to supply the *pyramidalis* muscle.

The psoas parvus was observed in one case to obtain its nerve-supply from the I. lumbar nerve.

The nerve to the *Pyramidalis*, with the above exception, was observed in seven cases examined to spring from the XII. dorsal nerve, which, after piercing the rectus muscle, entered the deep surface of the pyramidalis about its middle. In one case, in which the XII. dorsal nerve took the place of the ilio-inguinal, this branch passed up behind the internal pillar of the external abdominal ring to reach the deep surface of the muscle.

number of subjects examined, eighty-three.

Question III.

The following observers have furnished records of the distance of the kidneys from the iliac crest:—

Messrs J. H. M'Gee, Catholic University Medical School, Dublin; P. Macleod Yearsley, Westminster Hospital; ——— ———, St Mary's Hospital; F. H. Marston, Queen's College, Birmingham; J. H. Teacher, University of Glasgow; Gordon Brodie, Middlesex Hospital; Edward Fawcett, Yorkshire College, Leeds; James Musgrove, University of Edinburgh; A. Robinson, Owens College, Manchester; W. H. Thomson, Trinity College, Dublin; A. H. Walker, Charing Cross Hospital; A. Thomson, University of Oxford.

Here again an effort has been made to combine the advantages of a numerical and graphic method; Tables III. and IV. show, placed side by side, the results obtained by such an arrangement of the measurements in the males and females respectively. The central column in each figure represents in inches and corresponding millimetres the distance above and below the iliac crest. On either side is arranged in black blocks, drawn to scale, the number of cases which have been noted in which the lower border of the organ corresponds to the level shown on the scale above or below the iliac crest.

A glance at the chart will prove how misleading an average may be, and for this reason no attempt has been made to summarise the results. A curve uniting the extremes of the black blocks will more correctly express the facts. The somewhat striking differences to be noted between the number of cases recorded at, say 1 inch above the iliac crest and those at $1\frac{1}{8}$ inch, is readily explained by reason of the tendency to avoid small fractions of an inch; if, therefore, we would disregard all measurements below $\frac{1}{4}$ of an inch, we are likely to get results more generally uniform, and yet sufficiently accurate for all purposes.

In the males in one case, where both kidneys lay on a level with the iliac crest, the liver was much enlarged. In another case, where the kidneys lay at or about this level, they still retained their fœtal segmentation. Two cases were noted as cirrhotic, which lay about 1 and 2 inches respectively above the crest; and one case, where the left kidney lay $2\frac{1}{4}$ inches above the crest, the organ was remarkable for its very small size.

Among the females, a subject was examined in which the kidneys could be moved,—the right from a point $\frac{3}{4}$ of an inch below the crest to a point $\frac{3}{4}$ of an inch above the crest, the left from a point 1 inch below the crest to a point $1\frac{1}{4}$ inch above the crest. In another subject, in which the spinal column was curved laterally to the right in the lumbar region, the right kidney lay $\frac{3}{4}$ of an inch below the iliac crest. In a case where the left kidney lay $1\frac{1}{4}$ inch below the iliac crest the organ itself was enlarged, as also was the spleen; the gall-bladder, too, was much distended. In another case in which

the left kidney lay on a level with the iliac crest, a much-enlarged spleen was noticed. This was also the case in a subject in which the left kidney lay $1\frac{5}{8}$ inch above the crest. In three cases, where the kidneys lay at or near the level of the crest, the organs were noted as enlarged and fatty.

Dr W. H. Thomson, of Trinity College, Dublin, appends the following note to his report:—

"The kidneys of the female were found to be on a lower level than those of the male. This is not only indicated by the average, but it becomes more clearly shown when the individual cases are examined Thus, eight of the twenty-seven female kidneys on the right side and five on the left were either as low as, or lower than the crest, while only two of the right male kidneys and none of the left were in contact even.

"This suggested the influence of tight lacing in some at least of the female subjects. In one female subject, in which there was much evidence of extreme tight lacing (other than that indicated by kidney level), it was found that the kidney was very high up above the iliac crest, in fact completely hidden by the liver, which was apparently displaced downwards. Moreover, the organ was very small, that is, apparently atrophied from the pressure which the liver exerted upon it."

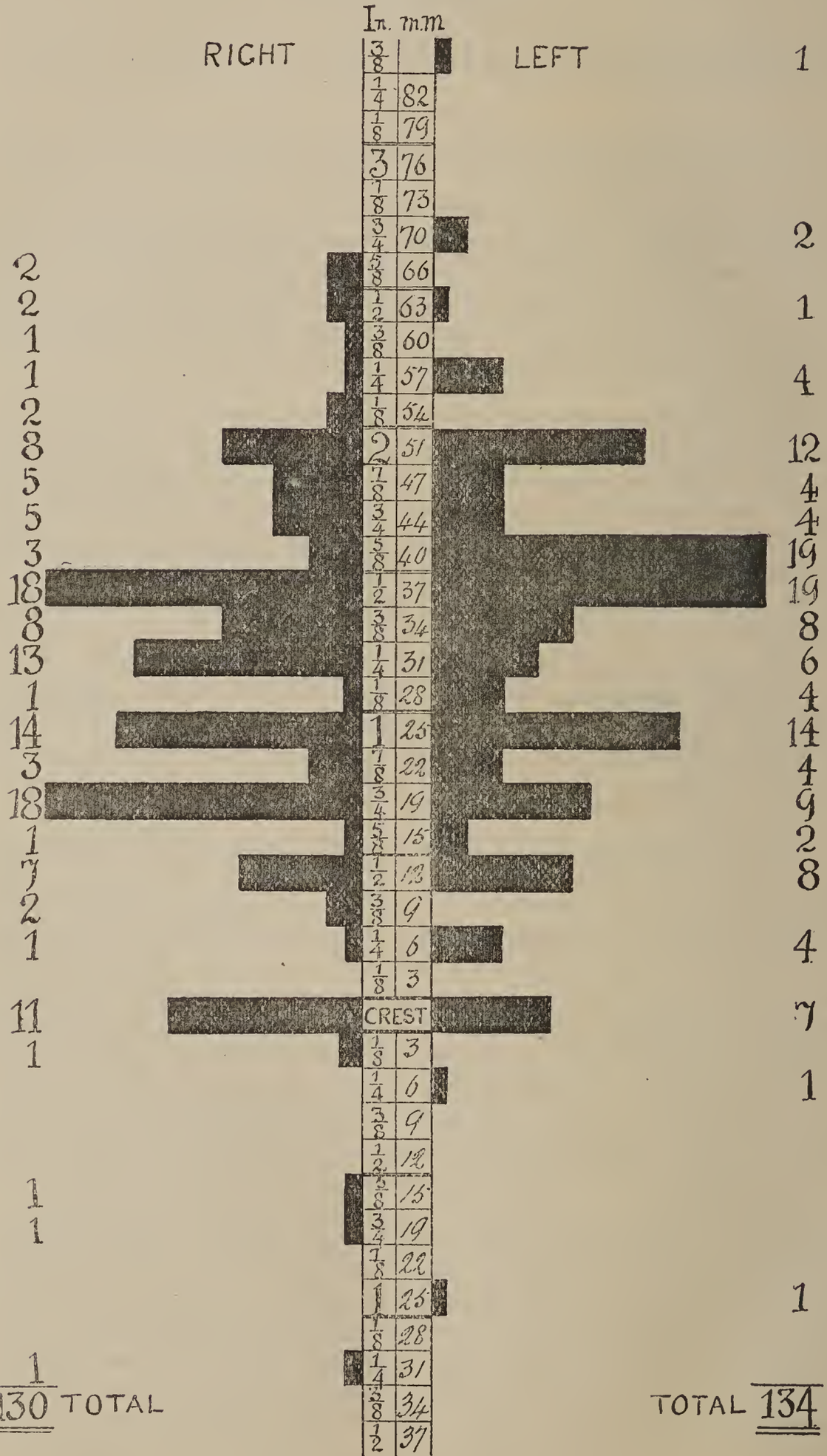
The same observer notes the average distance of the centre of the curve of the lower border of the kidney from the mid-dorsal line as 7·25 cm. on the right side in males and 7 cm. on the left. This latter distance was also found to be the average on both sides in the female subject.

Mr J. H. Teacher, of the University of Glasgow, in discussing the differences between the male and female measurements, says—"The difference in the level of the kidneys in the male and in the female subjects seems to be nearly in proportion to the difference in height. But whereas in the female the kidneys were abnormally low from being loose and from depression of the organs, especially the liver, there was only the case of hydronephrosis in which, in the male, the kidney was below the level of the crest of the ilium. In one or two cases in females, where there was great depression of the lower ribs and abdomen, the liver and spleen were depressed upwards; but, as the liver was turned a little so as to be deeper than normal, it is at least doubtful whether the kidney could be drawn up or not."

Measurements have been taken in 448 cases—264 in males, 184 in females. In males the largest number of kidneys on the right side lie between $\frac{3}{4}$ of an inch and $1\frac{1}{2}$ inch above the iliac crest; on the left side between 1 and 2 inches above the crest. Twenty-four kidneys lie at or below the level of the iliac crest out of a total of 264.

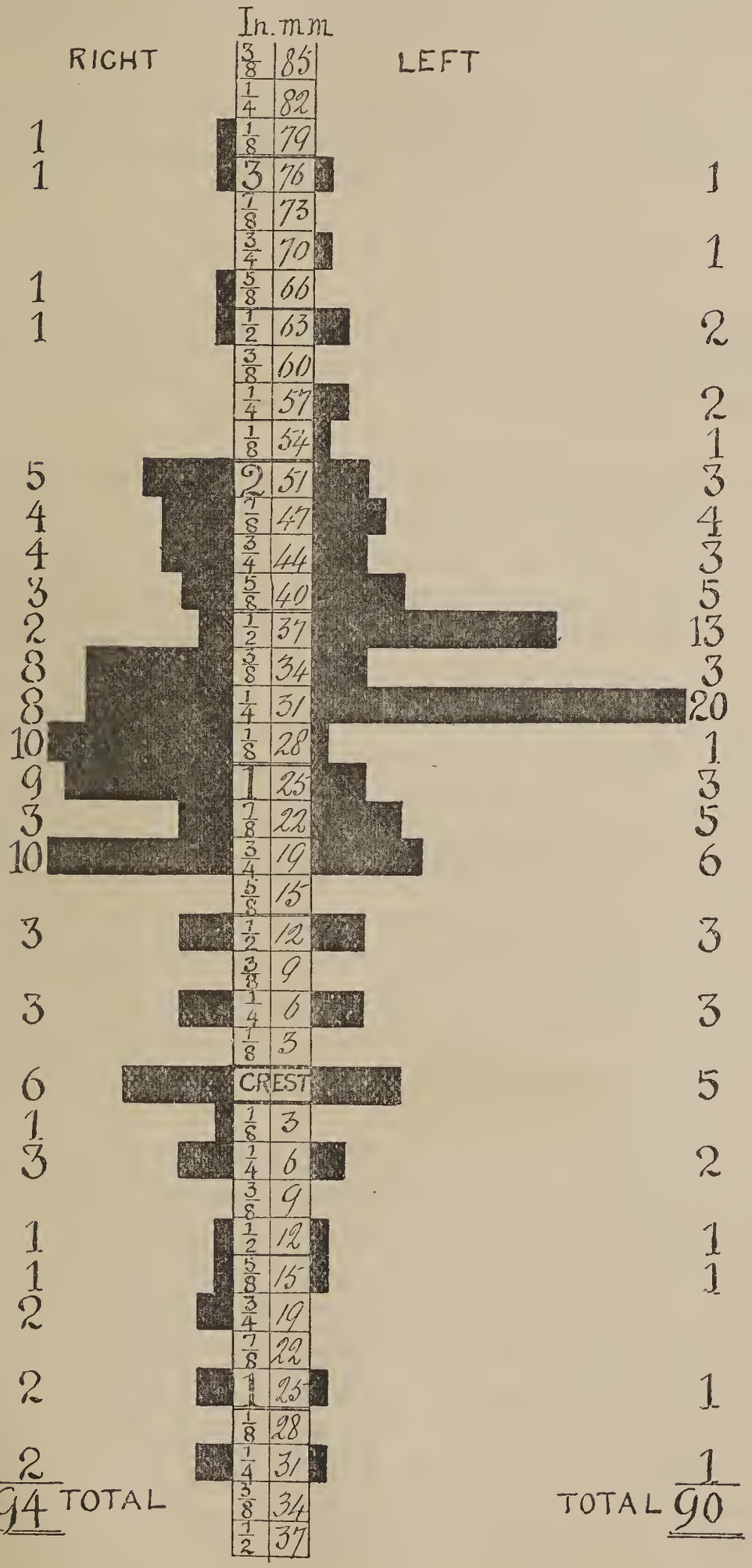
In the females forty-eight kidneys lie between $\frac{3}{4}$ of an inch and $1\frac{3}{8}$ inch above the level of the iliac crest on the right side—forty-one between $1\frac{1}{4}$ and $1\frac{5}{8}$ inch above the level of the iliac crest on the left side. Twenty-nine kidneys out of a total of 184 lie either at or

TABLE III.—*Males.*



Note.—Through error these diagrams have not been reduced to an inch scale as was intended.

TABLE IV.—*Females.*



below the level of the iliac crest; or, expressed in other words, 15 per cent. of kidneys in the female are placed either on or below the level of the iliac crest as compared to 9 per cent. in the males.

Dr HERBERT R. SPENCER has forwarded from University College, London, a series of measurements regarding the position of the kidneys in the infant at birth. His report is printed in its entirety.

THE DISTANCE OF THE LOWER MARGIN OF THE KIDNEY FROM THE ILIAC CREST IN THE INFANT AT BIRTH. By HERBERT R. SPENCER, M.D., B.S., M.R.C.P.

The accompanying table is a record of observations on forty human fœtuses which were either still-born or lived only a few hours. Fourteen of them had undergone intra-uterine maceration. The fœtus having been laid supine, with extended lower limbs, the abdomen was opened by a longitudinal median incision, and the kidneys exposed by dividing the rectum and turning it and the descending colon and the cæcum and ascending colon up for a sufficient distance. The small intestines were then held out of the way, and the peritoneum and areolar tissue around the kidney divided so as to clearly define the lower end of the organ. The measurements were taken from the tip of the anterior superior iliac spine to the level of the lower margin of the kidney on each side. The iliac spine was chosen in preference to the top of the crest, owing to the difficulty of accurately measuring the small distance between the top of the crest and the kidney in the new-born child, without greatly disturbing the natural relations, to avoid which, also, the thoracic organs and liver were left *in situ*.

From the table it appears that the right kidney was nearer to the level of the right anterior superior iliac spine than was the left to its corresponding spine in all except nine cases; in three of these it was further removed by $\frac{1}{8}$ of an inch; in the other six it was at the same distance. In two of these six cases (20, 24), however, my notes state that, although the distances were equal, the lower end of the right kidney was situated at a lower level than the left, with reference to a line drawn at right angles to the sagittal plane bisecting the vertebral column. In the cases in which the distance between the anterior superior iliac spine and the kidney was less on the right side, this kidney was also anatomically the lower.

There was no naked-eye disease of the organs which could affect the measurements, the morbid appearances being limited to minute hæmorrhages into the substances of and around the kidney.

No.	Sex.	Length (in inches).	Weight.		Height (in inches) of Right Kidney above AnteriorSuperior Iliac Spine.	Height (in inches) of Left Kidney above AnteriorSuperior Iliac Spine.	Remarks.
			lb.	oz.			
1	M	20¼	8	12	1¼	1⅛	
2	F.	17¼	3	14	Right kidney 1/16 lower than	left.	Macerated.
3	M.	20½	5	13	1	1¼	Macerated.
4	M.	18	4	7	¾	⅞	Left diaphragmatic hernia.
5	M.	12¼	1	7½	⅝	¾	
6	F.	18½	4	4	1	1 1/16	Macerated.
7	M.	13	1	9	⅝	13/16	
8	F.	16	3	8	¾	⅞	Macerated.
9	F.	16½	4	10	¾	1	Macerated.
10	F.	11	1	7	⅝	⅝	
11	F.	14	1	11½	½	¾	Macerated.
12	M.	20	7	0	1 1/16	1⅛	
13	F.	20½	7	8	1½	1¾	
14	F.	18½	5	9½	1 5/16	1 7/16	
15	F.	13	1	4	7/16	9/16	
16	F.	18½	5	8	¾	⅞	Enormous liver and spleen.
17	M.	20¼	6	7	1 1/16	1¼	
18	M.	18½	4	8	(¼ above crest of ilium).	(⅜ above crest of ilium).	Twins.
19	M.	20	5	6	⅞	1¼	
20	M.	19	6	3½	1 3/16	1 3/16	
21	M.	18	4	3½	⅞	1 5/16	Macerated.
22	F.	18	4	8	1	1	Macerated.
23	F.	22	8	6	1	1½	Macerated.
24	F	17	3	12½	13/16	13/16	
25	M.	19	5	11	1⅛	1¼	
26	F.	12	1	2½	⅝	¾	Macerated.
27	M.	18½	5	6½	1	1¼	Macerated.
28	M.	20	4	8	⅞	¾	Macerated.
29	F.	19	5	4	⅝	⅝	
30	M.	12½	1	13	⅝	⅝	
31	M.	15	2	7½	¾	⅞	
32	M.	18½	4	13	¾	1	
33	M.	20	5 (without brain).	11½	1¼	1¾	
34	M.	14	1	12	⅞	¾	Macerated.
35	M.	18½	5	8	1⅛	1¼	Macerated.
36	F.	17½	3	9	9/16	1 5/16	
37	M.	20	6	6	¾	⅞	
38	F	15¼	2	7½	1 1/16	1 3/16	Triplets.
39	F.	15⅜	2	8	¾	⅞	
40	F.	15¼	2	6½	¾	⅞	

Question IV.

A comparatively small number of observations has been made on the distribution of the cutaneous nerves to the dorsum of the foot. Returns have been received from the following:—

Messrs Gordon Brodie, Middlesex Hospital; E. H. Shaw, University College; ——— ———, St Mary's Hospital; P. Macleod Yearsley, Westminster Hospital; W. A. Harris, Queen's College, Birmingham; E. Fawcett, Yorks College, Leeds; J. W. Smith and J. B. Carter, The Owens College, Manchester; P. R. W. Santi, School of Medicine, Newcastle-on-Tyne; J. Symington, Minto House, Edinburgh; H. L. Sutherland, University of Aberdeen; A. F. Dixon, Trinity College, Dublin; A. Blaney, Catholic University Medical School, Dublin; A. Thomson, University of Oxford. Misses Piercy and Bale, London School of Medicine for Women.

A total of 229 feet have been examined, and in tabulating the results the graphic method has been adopted in preference to the descriptive. Twelve types are figured, and lettered A, B, C, &c., in order of their frequency. The first six are arranged in such a way as to show how the external saphenous replaces the external division of the musculo-cutaneous nerve, or *vice versa*. The last six (H, K, I, F, G, E) are arranged to display the progressive variations in the cutaneous distribution of the anterior tibial nerve.

In these types connecting loops between the nerves have been in some cases omitted, as the information necessary was not sufficiently complete.

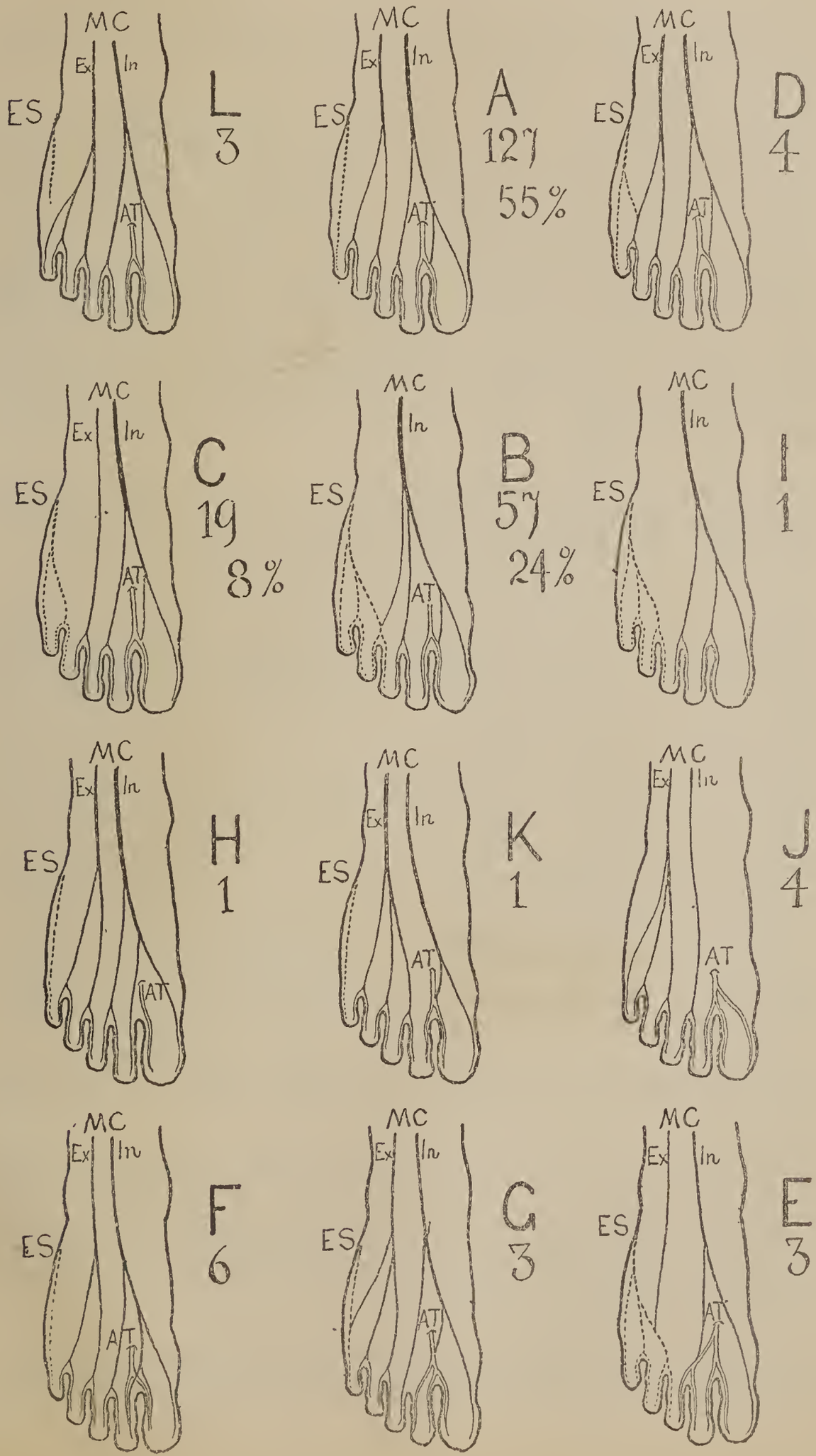
The figures attached to the types indicate the numbers of such specimens out of the total of 229 examined. In some cases the percentage is also given.

The musculo-cutaneous is represented by a solid black line; the external saphenous by a dotted line. The anterior tibial by a double outline.

The so-called normal arrangement represented by type A occurs in 55 per cent. of cases. Next in order is type B, where the external saphenous supplies the two and a half outer toes. This distribution of the nerves was met with in 24 per cent. of the feet examined. For further details the reader is referred to Table V.

In one case, recorded by Mr J. W. Smith of The Owens College, the internal saphenous supplied the inner side of the great toe; in another, it reached the inner side of the head of the metatarsal bone.

TABLE V.—*Variations in the Distribution of the Cutaneous Nerves on the Dorsum of the Foot. Number of Feet examined, 229.*



Question V.

In answer to the question, as to the occurrence of the diverticulum ilei, replies have been received from—

Messrs H. Hunter, Trinity College, Dublin; A. Robinson, Owens College, Manchester; ——— ———, St Mary's Hospital, London; F. H. Marson, Queen's College, Birmingham; Gordon Brodie, Middlesex Hospital, London; H. L. Sutherland, University of Aberdeen; W. Thelwall Thomas, University College, Liverpool; P. Macleod Yearsley, Westminster Hospital; P. R. W. Santi, School of Medicine, Newcastle-on-Tyne; J. Symington, Minto House, Edinburgh; A. Blaney, Catholic University Medical School, Dublin; J. H. Teacher, University of Glasgow; J. Musgrove, University of Edinburgh; H. D. Rolleston, St George's Hospital; A. Thomson, University of Oxford. Misses Piercy and Bale, London School of Medicine for Women.

Out of a total of 769 subjects examined the presence of Meckel's diverticulum has been noted sixteen times, or slightly over 2 per cent. Subjoined are the descriptions of the various examples noted.

Mr H. Hunter, of Trinity College, Dublin, describes a case as follows:—The subject was an adult male, who suffered from a large femoral hernia on the left side. The diverticulum, with the greater part of the ileum and much of the sigmoid flexure of the colon, formed contents of the hernia.

The distance of the diverticulum from the ileo-cæcal valve was 49 inches; it sprang from the anterior aspect of the gut, close to its mesenteric attachment. Its length was $1\frac{5}{8}$ inch when inflated, and its diameter about $\frac{1}{2}$ an inch, but towards its lower end it expanded suddenly into a hammer-shaped extremity, whose largest diameter was $1\frac{1}{4}$ inch. The diverticulum had no connection at its extremity with the umbilicus or other part, nor was there any trace of such.

The next case is recorded by Mr F. H. Marson of Queen's College, Birmingham. The diverticulum was situated 34 inches from the cæcum, was $2\frac{1}{8}$ inches in length and $3\frac{3}{4}$ inches in diameter.

Mr Sutherland, of Aberdeen University, records another case, but is unable to furnish further details.

Mr Thelwall Thomas, of University College, Liverpool, describes a case which came under his observation. The diverticulum was situated 36 inches from the ileo-cæcal valve, was $2\frac{1}{2}$ inches long, and was adherent to the mesentery by a slight double fold of peritoneum, which was attached to the diverticulum for half its length, the tip of the diverticulum being rounded and free.

Dr Symington, of Edinburgh, sends notes of a case in which the diverticulum was situated 56 inches from the ileo-cæcal valve, was

TABLE VI.—*Details regarding the Cases of Meckel's Diverticulum recorded.*

		Sex.	Age.	Distance of Diverticulum from Cæcum.	Character of Diverticulum.	Relation to Mesentery.
Mr H. D. Rolleston's Cases, . .	1	Male.	6 weeks.	11 inches.	Cul-de-sac ½ inch long; same lumen as bowel.	Lying in mesentery.
,, ,, . .	2	Male.	3 years.	26 inches.	Cul-de-sac dilated at end.	Free, not attached to mesentery.
,, ,, . .	3	Male.	16 years.	66 inches.	Cul-de-sac.	Lying in mesentery.
,, ,, . .	4	Male.	21 years.	25 inches.	Cul-de-sac 2 inches long; lumen same as bowel.	Not recorded.
,, ,, .	5	Male.	34 years.	31 inches.	Cul-de-sac 3 inches long; lumen equal ileum.	Not recorded.
,, ,, . .	6	Male.	37 years.	35 inches.	Cul-de-sac, lumen of ileum with fibrous cord from fundus, which has become adherent to ileum 2½ inches off, thus forming an arch.	Away from mesentery.
,, ,, . .	7	Male.	42 years.	70 inches.	Cul-de-sac lumen of bowel.	Lying in mesentery.
,, ,, . .	8	Female.	74 years.	34 inches.	Cul-de-sac lumen of bowel.	Not recorded.
,, ,, . .	9	Male.	75 years.	120 inches.	Cul-de-sac 3 inches long; lumen of bowel.	In mesentery.
,, ,, . .	10	Male.	80 years.	48 inches.	Cul-de-sac 3½ inches long; end dilated; walls of extremely thickened.	Away from mesentery.
Mr W. Hunter's Case, . . .	11	Male.	Adult.	49 inches.	1⅝ inch long; diameter ½ inch thick; hammer-shaped extremity.	Free.
Mr F. H. Marson's Case, . .	12	Not recorded.	Not recorded.	34 inches.	2⅛ inches long, 3¾ inches in diameter.	Not recorded.
Mr H. Sutherland's Case, . .	13				No details given.	
Mr Thelwall Thomas' Case, .	14	Not recorded.	Not recorded.	36 inches.	2½ inches long; extremity rounded and free.	Adherent to the mesentery by a double fold of peritoneum for about half its length.
Dr Symington's Case, . . .	15	Not recorded.	Not recorded.	56 inches.	2⅔ inches long, 3 inches in circumference; pointed at one side of its extremity.	Free.
Mr J. H. Teacher's Case, . .	16	Not recorded.	Not recorded.	49 inches.	1 inch long.	Free.

Total number of subjects examined, 769.

$2\frac{1}{2}$ inches long and 3 inches in circumference. The diverticulum was quite free, and somewhat pointed at one side of its extremity.

Mr J. H. Teacher mentions a case where the diverticulum was situated 49 inches from the ileo-cæcal valve, and measured about 1 inch in length; it was perfectly free.

A very valuable addition to the returns relating to this question has been made by Mr H. D. Rolleston of St George's Hospital, who has sent in a record of 337 subjects, which he examined in the post-mortem room of that hospital. He has tabulated the details of ten instances of this condition which he met with, and the aforementioned cases have been included, so as to make the table as complete as possible.

In a note appended to his report Mr Rolleston draws attention to the fact that nine out of the ten subjects in which this anomaly existed were males, a fact which he says cannot be accounted for by the supposition that more examinations were made in males than in females, for as a matter of fact there was not much difference in the number of males and females examined. He further adds that there was nothing to suggest that the formation of the pouch was due to traumatism, such as partial strangulation, &c., and in no case was the diverticulum attached to the umbilicus, though in one case (No. 6) there was a fibrous cord, which might have been broken away from the umbilicus and subsequently contracted fresh adhesions.

In conclusion, the Committee desire to place on record their thanks to all those gentlemen by whose co-operation they have been enabled to publish the present Report.

The Secretary will be pleased at all times to receive any suggestions in regard to this or allied matters. Communications to be addressed to him at the Anatomical Department, Museum, Oxford.

PROCEEDINGS OF THE

ANATOMICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

FEBRUARY 1892.

The Second Quarterly Meeting of the Society for the current year was held on Monday, February 22nd, in the Library of St Thomas's Hospital Medical School. Present—Sir William Turner (President) in the chair, and fifty-one members and visitors.

Mr T. Manners-Smith, B.A., M.R.C.S., and Mr H. B. Rorinson, M.D., M.S., were elected Members of the Society.

The following gentlemen were nominated for election at the next meeting:—T. H. Openshaw, M.B., B.S., Durham, F.R.C.S., proposed by A. Thomson, C. B. Lockwood, and J. Black. E. Cotterell, F.R.C.S., proposed by G. D. Thane, Bilton Pollard, and Percy Flemming. A. R. Kanthack, M.A. Lond., M.R.C.P., F.R.C.S., proposed by W. Bruce Clarke, W. P. Herringham, and H. D. Rolleston.

Sir William Turner gave an account of the *Cerebral Hemispheres* of *Ornithorhynchus paradoxus*, and compared them with those of *Echidna hystrix*. The paper is printed *in extenso* in the *Journal of Anatomy and Physiology*, April 1891.

Dr Alexander Hill had listened with the greatest interest to Sir William Turner's description of the brain of Ornithorhynchus paradoxus. He (Dr Hill) had himself studied the brain at various times for some years, although he found it in certain respects so paradoxical that he had abstained from publishing his results, in the hope that he might in the meantime discover the explanation of its singular departures from the ordinary mammalian type.

The brain in Dr Hill's possession would appear to have been taken from a much older specimen than that of Sir William Turner. Dr Hill illustrated the points in which he did not agree with Sir William Turner, by a series of photographs of his specimen.

The hemisphere is very much expanded and thin from above downwards. It completely covers the optic lobes, and hides also a large part of the cerebellum. It shows a well-marked division into frontal, temporo-sphenoidal, and occipital lobes, but no convolutions or fissures so far as Dr Hill could see, with the exception of the rhinal and hippocampal fissures.

The olfactory bulb is a good deal larger than figured in Sir William Turner's diagram. Its connection with the cerebrum is by means of an olfactory peduncle, which is cut off from the under surface of the hemisphere by a deep fissure on either side. The two fissures incline towards one another, leaving but a narrow isthmus between the hemisphere and the olfactory peduncle. The olfactory peduncle is applied at its root to the inner surface of the temporo-sphenoidal lobe, upon which it fades away.

The cornu ammonis has a remarkable course, being continued forwards above the commissures and above the velum interpositum almost to the front of the brain. The fissure which Sir William Turner suggested might possibly be the splenial fissure is a fissure which lies above the cornu ammonis (being really the homologue of the hippocampal fissure); it is continued forwards to the frontal extremity of the brain.

The outer surface of the brain is marked by deep furrows for arteries, but by no fissures. The furrow for the middle cerebral artery occupies the ordinary situation of the fissure of Sylvius.

Dr David Hepburn communicated the following Note on *a large defect in the Capsule of the Shoulder Joint.*

The comparative rarity of the following appearances warrants their being recorded somewhat in detail, although the condition is probably pathological.

During the dissection of a right upper limb in an adult male, when the deltoid muscle was detached from its origin and turned downwards, the subdeltoid bursa attracted attention by reason of its large size. It extended as far back as the upper border of the insertion of the teres minor, and as far forwards as the insertion of the subscapularis.

Continuing the dissection, the acromion process was sawn through near its junction with the spine of the scapula and turned outwards, when the continuity of the subdeltoid bursa with the subacromial bursa was seen.

On opening the bursa its cavity was found to communicate directly with the interior of the shoulder joint through an aperture of large size. Careful examination of the capsule of the shoulder joint showed that its attachments were normal, except on the subacromial or superior aspect, where the capsule presented an arcuate free border. The anterior extremity of this border was attached to the upper part of the lesser tuberosity of the humerus: the posterior extremity was attached to the humerus immediately above the insertion of the teres minor muscle, external to the articular cartilage on the head of the humerus. The distance between the anterior and posterior extremities of the arcuate free border was *two and a half inches.* Along the entire length of this arcuated border, the cavity of the shoulder joint was quite open, and communicated with the subacromial and subdeltoid bursa, which thus became a direct extension of the joint-cavity. The cartilage was present on a large area of the head of the humerus, but from the bicipital groove of the humerus

backwards to the insertion of the teres minor, a porcellaneous deposit had replaced the cartilage and filled up the groove of the anatomical neck, and had modified the appearance of the great tuberosity. The inferior surface of the acromion process was also smooth and somewhat hollowed to accommodate the part of the humerus just described, and on this surface there were also patches of porcellaneous material. The part of the acromion process with which the humerus articulated did not appear to be covered by synovial membrane.

The acromion process itself next attracted attention. It consisted of two parts, an external and an internal, the division extending across into the acromio-clavicular joint, and strong ligamentous bands connected the two segments.

The external portion articulated with the clavicle on its inner border, and with the humerus on its under surface. Moreover, it was joined to the internal portion by an arthrodial articulation, the cavity of which opened into the acromio-clavicular joint.

The subacromial extension of the synovial lining of the shoulder joint did not extend over the inferior aspect of this articulation.

The *supraspinatus* muscle was inserted into the upper surface of the arcuate portion of the capsule, and not into the humerus.

The *infraspinatus* muscle was partly inserted into the posterior surface of the arcuate arrangement, and partly into the humerus immediately above the teres minor, by a small tendon which pierced the capsule. The *teres minor* muscle was inserted into its usual place on the posterior aspect of the great tuberosity of the humerus.

The *subscapularis* muscle had the usual insertion, subjacent to which there was a bursa communicating with the interior of the shoulder joint.

The long head of the *biceps* had its usual disposition, but the bicipital groove was prolonged above the articular surface of the head of the humerus, which was also grooved by the long tendon.

On the superior aspect of the humerus there was no trace of an anatomical neck, and the convexity of the articular surface was continued without interruption over the upper part of the bone. In this position the subdeltoid bursa gave the limit of the joint-cavity, and it was at a distance of one inch and a quarter from the margin of the articular cartilage.

The glenoid cavity did not present any deviation from normal appearances. The gleno-humeral ligament was chiefly under cover of the posterior part of the arcuate free border of the capsular ligament. It extended from the upper part of the capsular ligament to the head of the humerus immediately internal to the highest point of the insertion of teres minor. The anterior border of this ligament was free, but its posterior border remained attached to the capsule. The small slip of the insertion of infraspinatus which was directly inserted into the humerus pierced the capsule superficial to the gleno-humeral ligament.

The synovial membrane was everywhere smooth and glistening, but in the subacromial region it presented several fringes.

The articulation between the outer and inner portions of the

acromion process corresponded to the position of the plate of cartilage between its two centres of ossification. The margins of the cavity were prominent, and they were joined by fibrous bands, except on the inner side, where this joint-cavity opened into that of the acromio-clavicular articulation.

After these observations were made it was recalled that in the earlier stage of the dissection the clavicle was seen to have been broken internal to the conoid ligament. Union between the fragments had taken place, and the displacement was slight.

A closely corresponding condition was found in the opposite shoulder joint, but the clavicle had not suffered fracture, nor did the acromion process present a division into two parts. The glenoid ligament at one part was deformed by ossific deposit.

The presence of practically the same condition of the shoulder joint on the two sides of the body eliminates the possibility of its having been produced by violence. Probably the force which produced fracture of the clavicle also led to diastesis of the acromion process, and the subsequent formation of a false articular cavity.

The appearances in the two shoulder joints are doubtless the result of pathological processes. The large size of the subacromial bursa; the separation of the capsular ligament from the head of the humerus; the rounded appearance of the head of the humerus, with the deposit of porcellaneous material; the alteration of the outline of the articular cartilage, and the formation of an ossific plate in the glenoid ligament, all point to a condition of *osteo-arthritis* rather than to Charcot's disease of joints.

On the other hand, under the term osteo-arthritis, Mansell Moullin, in his text-book of surgery, gives a figure and a summary of appearances which in their main features practically correspond with those recorded in connection with the present specimens.

A discussion followed, in which Sir W. Turner, Professor Thane, Professor Anderson, Professor Curnow, Professor Howes, and Mr Makins took part, the general opinion being that the appearances indicated pathological changes.

Mr F. G. Parsons demonstrated *some points in the Myology of Rodents.*

(*a*) *Relation of the Pectoral Muscles to the Panniculus Carnosus.*

In Rodents the panniculus carnosus divides into two layers over the ventral surface of the abdomen, a superficial and a deep. The superficial layer is, as a rule, not very well marked, but is perhaps best seen in the porcupine and guinea-pig: the fibres run forwards and inwards entirely superficial to the pectoral, from which they are not separated by any fascia. The fibres are lost on the surface of the pectoral, but are on the same plane as the platysma, which covers the anterior part of that muscle.

The pectoral muscles in Rodents consist of a sternal and an abdominal portion, the latter rising from the linea alba for a variable distance, the abdominal fibres pass to be inserted deep to the sternal, and some of the highest reach the coracoid process and shoulder capsule, and are

looked upon as the pectoralis minor. The deep fibres of the panniculus are much more strongly marked than the superficial ones : they pass in the same direction forwards and inwards, but are deep to the pectorals, and are inserted into the cartilages of the posterior true ribs close to the sternum and into the linea alba. The most anterior fibres, however, of the deep part arch over the floor of the axilla, and

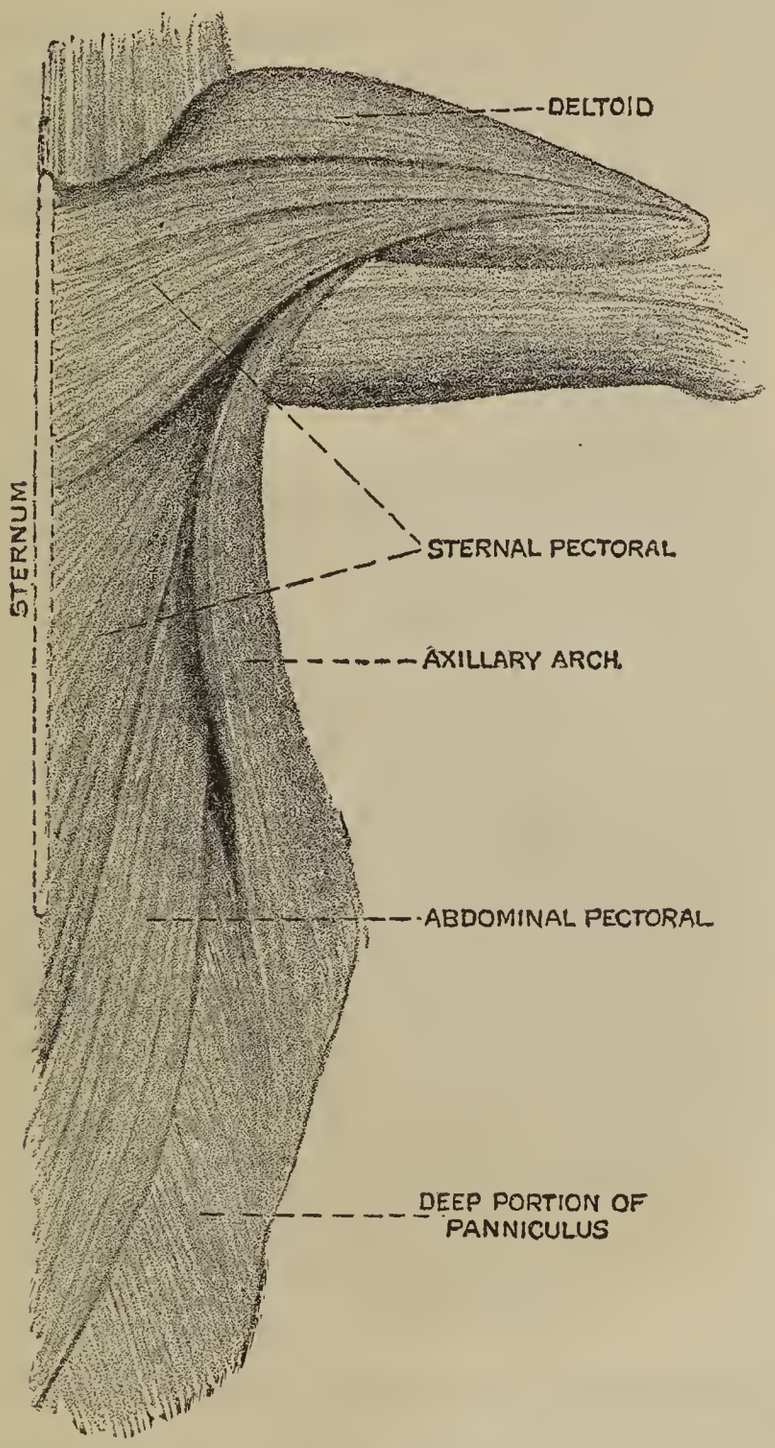


FIG. 1.—Dissection of Guinea-Pig, showing Panniculus.

pass between the sternal and abdominal fibres of the pectoral, to be inserted deep to the former.

Over the dorsum both layers of the panniculus fuse into one, covering the trapezius and latissimus dorsi.

The nervous supply of both layers of the ventral portion of the panniculus is a large nerve which comes off from the most posterior cord of the plexus, the cord that corresponds to the internal of

human anatomy : this nerve, which may be regarded as a large internal anterior thoracic, runs backwards deep to the deep layer of the panniculus, supplying both it and the abdominal and posterior sternal fibres of the pectoral. The lateral part of the panniculus seems to be supplied by the lateral cutaneous branches of the intercostal nerves, but it is difficult to be sure whether they actually supply the muscle, or only pierce it on their way to the skin.

The fact of the abdominal and posterior sternal fibres of the pectoral being sandwiched in between two layers of the panniculus, and having a bundle of fibres of that muscle passing between the sternal and abdominal parts of it, seems difficult to explain, except by regarding the posterior fibres of the pectoralis as part of the panniculus which

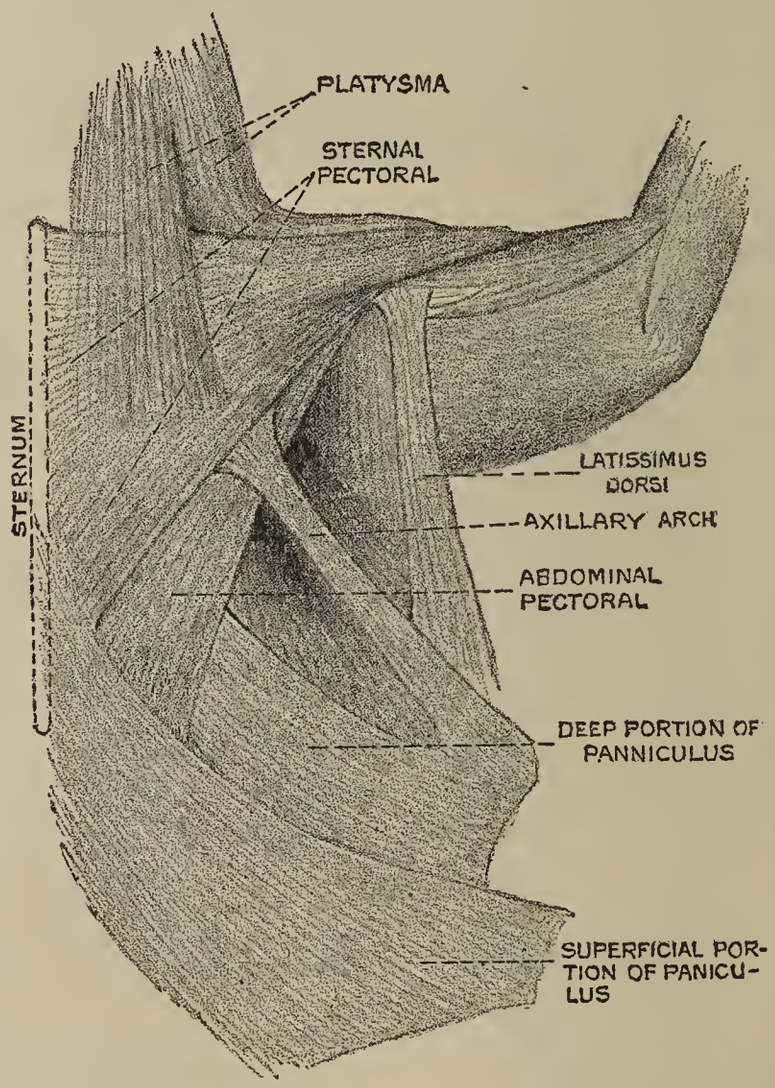


Fig. 2.—Dissection of Agouti, with superficial portion of Panniculus removed.

has acquired bony attachments and become greatly developed owing to the value of the direction of its fibres in moving the humerus.

This view is borne out by the nerve-supply. Again, if the pectoral or part of it could be regarded as panniculus, the origin of the sternalis would be less obscure ; and as the ventral part of the panniculus is supplied by the internal anterior thoracic, one would expect the sternalis to be supplied by that nerve, whether it be regarded as a part of the superficial panniculus or of the pectoral.

The fibres of the deep layer of the panniculus which run across the

axilla to between the sternal and abdominal parts of the pectoral are probably represented in Man by the axillary arches or achselbogen, and as they come off from the antero lateral part of the panniculus, their nerve-supply would be either internal anterior thoracic, or a lateral cutaneous branch such as the intercosto-humeral.

(*b*) *On the Adductor Magnus in the Agouti.*—In the Agouti the adductor magnus is inserted into the posterior border of the femur, but is not continued to the condyle, nor is it pierced by the femoral artery, which is altogether in front of it.

A well-marked muscular slip from the semimembranosus, which separates from that muscle soon after it arises, is inserted just above the internal condyle, and the artery passes between it and the adductor magnus.

The slip is supplied by the great sciatic, while the adductor magnus is supplied only by the obturator. This arrangement in the Agouti bears out the statement that part of the adductor magnus in Man is derived from the ham-string muscles.

(*c*) *Double Rectus Capitis Posticus Major.*—This muscle I have found divided into two distinct slips on three occasions in the guinea-pig, but in no other rodent: one of these slips was superficial and the other deep, and both had the usual attachments.

The subject was discussed by Sir W. Turner, Messrs Thomson, Curnow, and Thane.

Mr F. C. Abbott showed the following specimens:—

(*a*) *Specimen of Right Aortic Arch*, from a dissecting-room subject.

The arch passes first upwards and to the right, then backwards and to the left, and then directly to the left in front of the spine, before it turns downwards at the descending arch, which together with the descending thoracic aorta is in the usual position met with in the case of a left arch.

The transverse arch thus forms a curve with the concavity forwards, in which lie the trachea and œsophagus, the highest portion of the arch reaching the level of the lower border of the second d. v.

The order of the vessels arising from the arch is left carotid, right carotid, right vertebral, right subclavian, and left subclavian.

The left carotid arises from the front of the ascending arch, passing obliquely upwards and to the left in front of the trachea, which it crosses at the level of the 1st and 2nd d. v.

The right carotid arises above this from the front of the arch, at the junction of the ascending and transverse portions, passing up in front of the vertebral and subclavian.

The right vertebral arises from the upper border of the transverse arch, close to but separate from the right subclavian, the front of which it crosses, to enter the transverse process of the 5th c. v.

The right subclavian arises from the upper border of the arch, slightly to the right of the mid-line, and turns outwards behind the vertebral, giving off the superior intercostal as its first branch.

Finally, the left subclavian arises from the upper part of a pouch which is present at the front of the arch at the junction of the

transverse and descending portions, and which is joined below by the ductus arteriosus, which is large and patent in the outer part of its

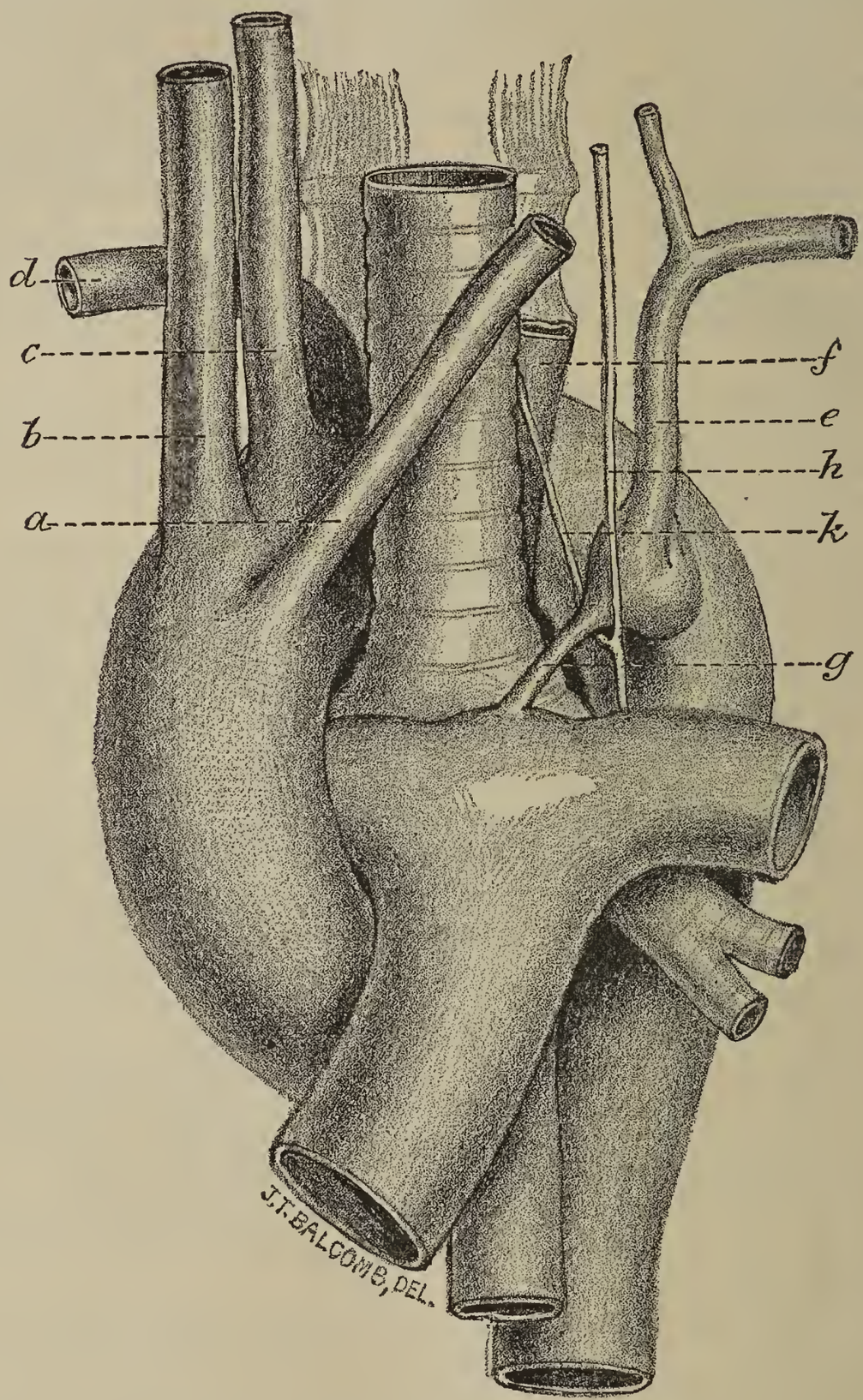


FIG. 3.—Diagram of the Right Aortic Arch.

a. Left Carotid.
b. Right Carotid.
c. Right Vertebral.
d. Right Subclavian.
e. Left Subclavian.
f. Œsophagus.
g. Ductus Arteriosus.
h. Vagus.
k. Recurrent Laryngeal.

course, but obliterated at its origin, which is situated exactly at the bifurcation of the pulmonary artery.

The pouch-like dilatation represents the posterior root of the 4th left aortic arch, and is crossed by the left vagus, which gives off the recurrent laryngeal beneath the ductus arteriosus, to pass up between the trachea and œsophagus.

The right vagus had unfortunately been cut away.

The left vertebral is given off from the subclavian in the usual position, and enters the 6th c. v.

Though many cases of right aortic arch have been recorded with the order of the four large vessels the same as in the specimen, there is only one other on record in which the right vertebral also came separately from the arch.[1]

(*b*) *Specimen of Left Aortic Arch, with abnormal arrangement of the Branches.*

The arch lies in the usual position, but is somewhat low, the highest point being on the level of the upper part of the 4th d. v. Arising from it exactly in the mid-plane is a short common trunk, which divides after a course of $\frac{1}{2}$ an inch into the two common carotids. From the back of the right common carotid, about 1 inch from its origin, arises the right vertebral, which passes up to enter the transverse process of the 5th c. v.

Next from the arch arises the left vertebral, also entering the 5th c. v.; close to this, the left subclavian; and lastly, from the back of the arch, the right subclavian, which proceeds outwards behind the trachea and œsophagus to its usual position.

This specimen is almost exactly similar to one shown by Mr Gordon Brodie before the Society in November 1888.

(*c*) *Specimen of Pulmonary Valve with 4 Segments.*

In this heart the only abnormality is in the pulmonary artery, the valve of which presents 4 segments. Three of these segments are of equal size, but the 4th is distinctly smaller, and presents a smaller pouch behind it. This segment is attached to that part of the wall of the artery which is developed from the septum, and not, as is usually the case, to the external part of the wall.

This specimen is therefore in opposition to the view that the extra segment is developed from the anterior or external cushion of the four from which both the pulmonary and aortic valve segments are developed.

Messrs Stanley Boyd, Black, and Thane made some remarks.

Dr Howden exhibited a *heart* with several *developmental anomalies.*

Professor Sherrington gave a demonstration of the *sensory nerve supply of the hind limb of Macacus rhœsus*, illustrated by lantern slides.

The meeting then adjourned.

[1] By Otto in 1835. Henle, b. iii. p. 226.

PROCEEDINGS OF THE

ANATOMICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

MAY 1892.

The Third Quarterly Meeting of the Session was held on May 23 at King's College, London, the President, Sir William Turner, in the chair. Present—Twenty-seven members and visitors.

The following gentlemen were elected members of the Society:—T. H. Openshaw, M.B., M.S., F.R.C.S., Demonstrator of Anatomy at the London Hospital; E. Cotterell, F.R.C.S., Assistant Demonstrator of Anatomy at University College, London; A. A. Kanthack, M.B., M.R.C.P., F.R.C.S., John Lucas Walker Student of Pathology at Cambridge.

It was resolved that the next meeting of the Society be held in Edinburgh on Tuesday, August 2, one day prior to the meeting of the British Association for the Advancement of Science, in that city.

Mr J. E. Lane exhibited a sketch of the *right subclavian artery*, running an abnormal course along with the vein, anterior to the scalenus anticus.

Mr Bland Sutton showed, under the microscope, *sections from the growing antler of a stag* (*Cervus elaphus*), which demonstrated that the superficial layer of the velvet is skin, and that the hairs which grow from it are furnished with sebaceous glands. Some of the glands are of large size.

This is of some interest, because cysts similar to wens have been found on deers' antlers.

The President remarked that many years ago he had become possessed of the head of a roe-deer presenting striking peculiarities. The horns were clothed with a thick, greasy, folded integument, the furrows of which were filled with a collection of sebaceous matter. The horns were remarkably hypertrophied, and gave rise to numerous dendritic growths of bone. He had seen a photograph of a similar head at Heidelberg. He had been unable to ascertain whether the head had belonged to an animal which had been castrated, or in which

the testis had been injured. In the light of Mr Sutton's communication, he would be disposed to consider the abundant fatty matter occupying the furrows between the skin-folds as due to the secretion

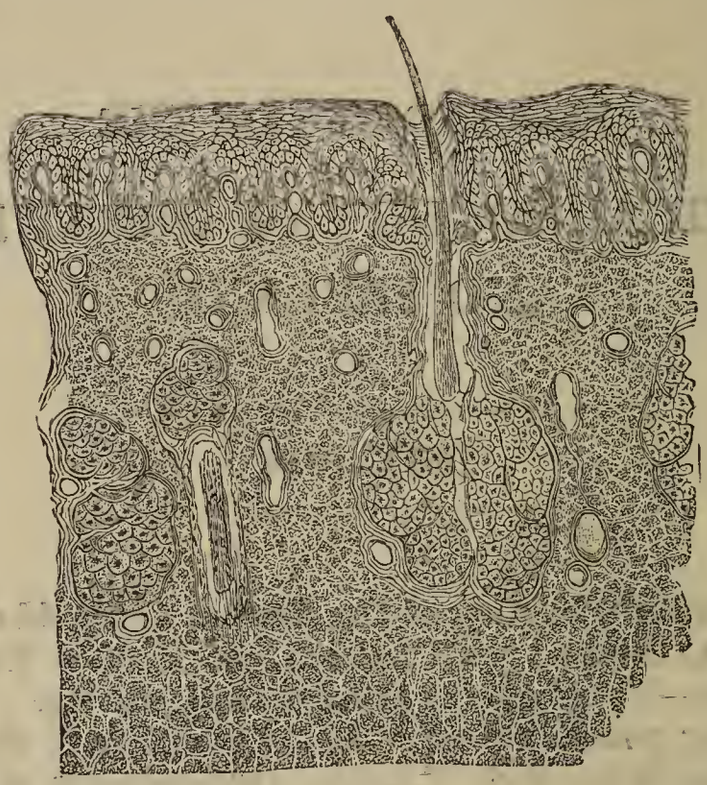


Fig. 1.—A section of "velvet" from a stag's antler (*Cervus elaphus*) to show the sebaceous glands.

of the sebaceous glands, which had persisted along with the tegumentary covering of the antlers.

Mr Bland Sutton read the following paper *On an Occasional Articulation between the Cuboid and the Head of the Astragalus*:—

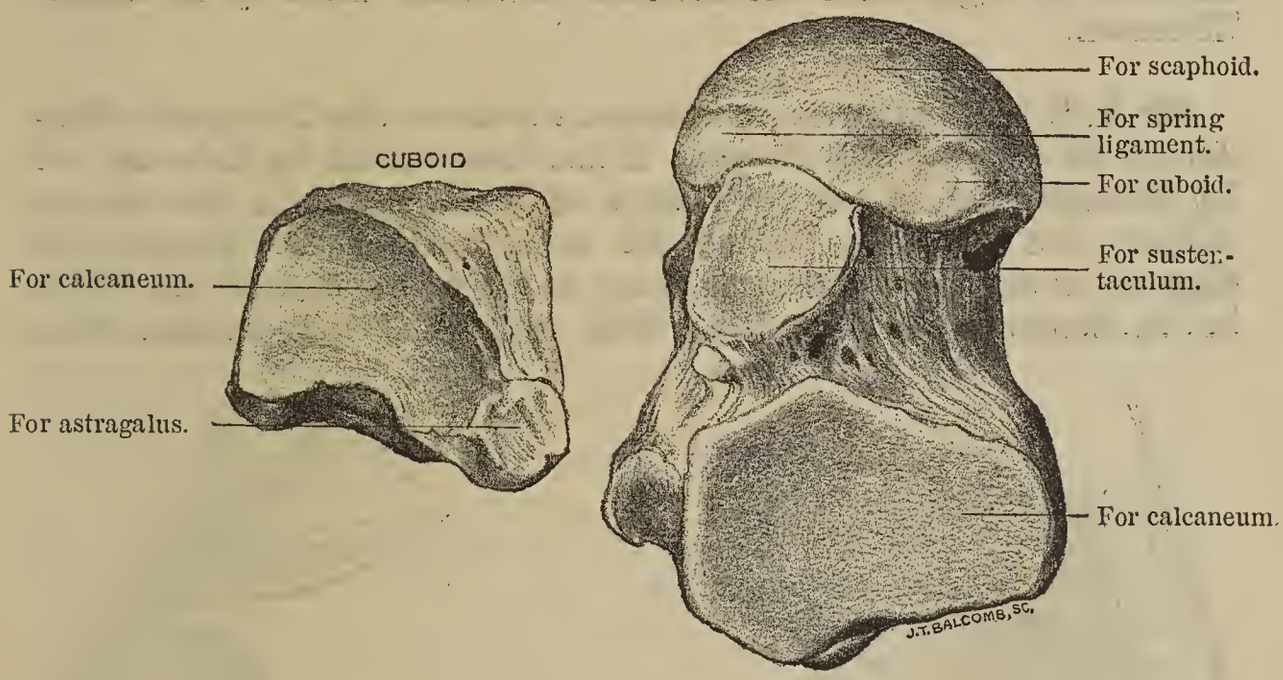
About a year ago, having occasion to look carefully into the articulations of the tarsal bones, I came across a skeleton in which the cuboid articulated with the head of the astragalus; on investigating the matter, I find that this is by no means very rare.

Jutting from the inferior internal angle of the posterior surface of the cuboid, there is a process (sometimes called the calcanear process of the cuboid) which projects beneath the sustentaculum tali. This process occasionally terminates in a rounded facet, and comes into contact with the under surface of the head of the astragalus.

This additional facet on the astragalus is situated to the outer side of that for the spring ligament, and its presence modifies the outline of the cartilage-covered area of the head of this bone, not only by making it more extensive, but by filling up the rectangular fossa which usually exists in the angle formed by the facets for the sustentaculum and the spring ligament. I have been unable to make out that this articulation depends on occupation, or upon any malformation of the foot or leg. In the first example in which I detected the condition, the variation was present on both sides, and as the complete skeleton was at my disposal it enables me to state that the

remaining elements of the skeleton were natural in every way. An examination of the foot, which Professor Stewart has been good enough to accept for preservation in the Museum of the Royal College of Surgeons as a type specimen of this variation, shows that the remaining elements present nothing unusual.

Professor THANE had seen a tarsus in which this articulation was present; and Professor MACALISTER had seen two specimens in the



dissecting-room at Cambridge. He was disposed to consider the condition a rare one, as he had not discovered a single instance among the numerous skeletons annually procured for distribution among the students, which he had carefully looked over.

Dr ALFRED HUGHES showed a specimen of *an Unusual form of Abnormal Obturator Artery arising from the Profunda Femoris along with the deep Epigastric Artery.* This artery arose in Scarpa's triangle, passed obliquely upwards into the abdomen, in front of the crural canal, then dipping behind the pubes to reach the obturator foramen. As the artery passed into the abdomen, it lay just in front of a point which would be occupied by the neck of a femoral hernia, had such a condition existed.

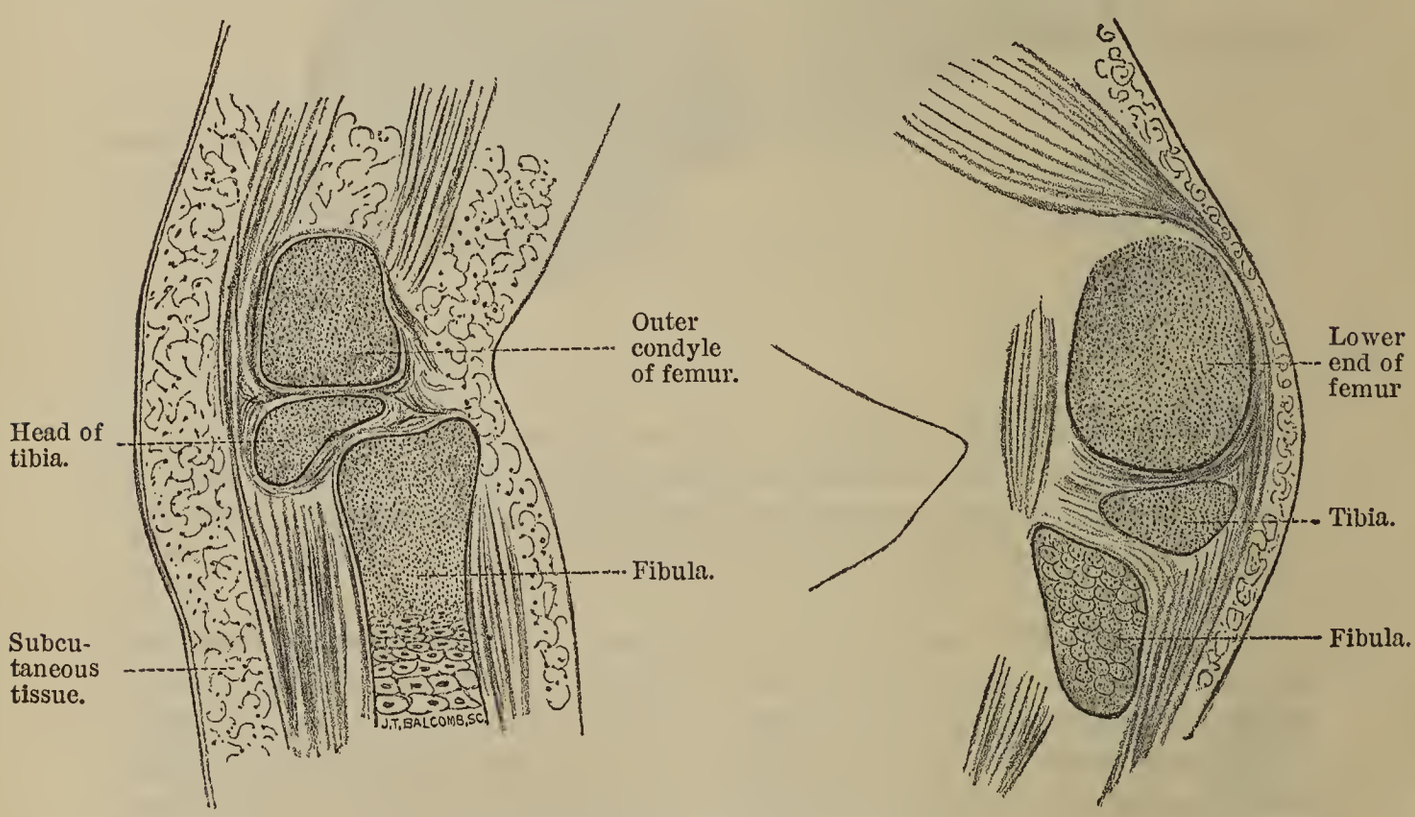
Dr Hughes showed how this specimen differed very markedly from the usual forms of abnormal obturator artery, and that the condition must be very rare, as he had failed to find a similar case recorded. The only specimen presenting any great similarity to this was described in Green's *Varieties in the Arterial System*, 1830, where reference is made to a cast of a specimen in Dr Macartney's museum, in which the normal obturator artery was absent, but in which branches ascended from the profunda artery towards the obturator foramen. Dr Hughes pointed out that, as these vessels did not enter

the abdomen, they differed very markedly from the abnormal vessels shown by him.

Professor Macalister stated the cast referred to by Dr Hughes is now unfortunately missing.

Professor Curnow mentioned that the arrangement shown in this specimen must be very rare. In Prof. Wood's book on Hernia a case is described in which the obturator artery sprang from the internal circumflex of the profunda femoris. Prof. Thane referred to an instance of origin from the internal circumflex noted by Mr Arthur Thomson.

Mr A. S. Grünbaum communicated a note on the *Embryonic Relation of the Fibula to the Femur.* It has been stated by Leboucq and by Bernays that, at an early stage of development in the human subject, the fibula, as well as the tibia, touches the femur; and Gegenbaur mentions the same thing in the description of the fibula in his *Anatomie des Menschen.* This is certainly not the case from



Antero-posterior sections of knee-joint.

(*a*) Through knee-joint and middle of fibula.

(*b*) Through knee-joint and outer edge of fibula.

the sixth week onwards, and before that time it is impossible to differentiate the embryonic tissue and say which portion is going to become fibula and which femur. The two figures show the state of things in the seventh and ninth week respectively, from which it appears that the fibula is actually further away from the femur at the earlier date. Morphologically one would anticipate a contact between the two bones; as a matter of fact, it appears not to be the case.

Professor W. Anderson read a paper on *The Delimitation of the Regions of the Abdomen*, which will be found *in extenso* in the body of the *Journal of Anatomy and Physiology*, p. 543.

A discussion followed, in which the President, Messrs Macalister, Thane, Symington, Clement Lucas, Curnow, and Bland Sutton took part.

At the suggestion of the President the subject was referred to a Committee, to consist of Prof. Anderson, Prof. Cunningham, Prof. Macalister, Dr Symington, Prof. Thane, and the Honorary Secretary *ex officio*.

Dr Johnson Symington read a paper on *The Relations of the Peritoneum to the Descending Colon in the Human Subject*, which will be found *in extenso* in the body of the *Journal of Anatomy and Physiology*, p. 530.

The President remarked on the importance of having a clear notion of the meaning of the term "mesentery." Mere laxity of the peritoneum would not constitute a mesentery unless the two layers were closely apposed to each other.

Professor Anderson said it was rare to meet with a true mesentery in the performance of colotomy. The relation of the peritoneum to the descending colon varies with the amount of distension of the gut. Thus in the dissecting-room it is not uncommon to meet with the two layers almost in contact when the gut is collapsed, but when a moderate amount of distension is produced by injection or inflation, the normal arrangement is at once assumed.

Professor Thane expressed his concurrence with the views enunciated by Dr Symington and Prof. Anderson as to the comparative rarity of a true mesentery.

Dr H. D. Rolleston gave a *resumé* of a paper *On some Points in the Anatomy of the Supra-Renal Capsules*, illustrating the same by preparations and microscopic sections. The paper will be found *in extenso* in the body of the *Journal of Anatomy and Physiology*, p. 548.

Mr R. W. Michell, M.A., communicated the following *Note on the Topography of the Rectum*:—

The English text-books of human anatomy agree in describing the course of the rectum and its relations to the peritoneum in the same, or nearly the same, way.

They either tell us that the gut passes from left to right to reach the mid-line of the sacrum, and then follows the curve of that bone, or that the gut passes slightly across the mid-line to the right side, then turns on itself and reaches the mid-line again in front of the body of the 3rd sacral vertebra, from which point it follows the curve of the sacrum.

They also tell us that the peritoneum forms a meso-rectum which is complete, short, and ties the rectum firmly in one or other of the situations above described.

These two statements seem to be more dogmatic than is warranted by the evidence.

If a large number of rectums be examined, a considerable variety in the position of the gut will be noticed.

Those rectums which are distended, especially those which are distended before death, will, for the most part, be found placed so much to the right of the mid-line of the sacrum that they are in front of the right internal iliac artery.

Distension seemingly increases the bend of the first part of the rectum.

Those rectums which are small and contracted for the most part do not pass so far across the mid-line to the right as those do which are distended, but if in these cases the gut be injected with hot-water through the descending colon to soften the surrounding fat, it will be observed that the rectum dilates, and, while it dilates, changes its position for one more on the right side. The bend of the first part is greatly increased, and the rectum swings or slides across the front of the sacrum. The movement appears to be either a swing or a slide.

In the first case the gut moves like a gate on its post, in the second it does not.

When some of the rectums were examined, they were found to be without the definite meso-rectum of the books; the peritoneum did not cover the back of the gut.

These cases were of those in which *ante-mortem* distension was a feature. This seemingly pointed to an inverse relationship between the presence of distension and the presence of a meso-rectum.

To try whether this were so or not, the pelvis was filled with water hot enough to feel warm to the hand, and the fat was thus melted after a time.

The rectums experimented with were of those which were not distended at all, or very slightly so. Hot-water was injected, and in very many cases the gut slid under the peritoneum over to the right side, and became an anterior relation to the right internal iliac artery.

About the time that these observations were made, Prof. Macalister made a transverse section of a frozen body in which the rectum and bladder were fully distended at the time of death with fæces and urine respectively. In this specimen the rectum extended to the right of the mid-line, and the right internal iliac artery had a posterior relation to it.

Further evidence in favour of the view that a distended rectum crosses farther to the right than does any undistended one is seen in the following numbers deduced from my observation. Number of bodies examined, 116; number of times the gut was in front of the right internal iliac artery, 75.

Some of these were noted because the dextral extension of the gut was a marked feature, but many were taken at random. No record has been kept of the numbers of each class, so the percentage is probably higher than it would have been had this feature been sought in all bodies. The results of later experience point to the proportion

being larger than 75 out of 116, and to the sliding of the rectum as distinguished from its swinging being its most frequent manner of passing across to the right.

Mr C. Dudley Cooper (introduced by Prof. Thane) showed the *Skull of an Aboriginal Australian*, which had been found as part of a complete skeleton at Williamstown, Victoria.

The capacity of the skull was 1500 c.c., which was greater than any recorded by Prof. Flower[1] by 40 c.c., and far above his average of 1298 c.c. for 32 skulls examined. The average given by MM. de Quatrefages and Hamy[2] is 1269 c.c., and 1230 c.c. by Sir William Turner,[3] based on an examination of 34 skulls. The latter, however, mentions the skull of a male from Port Curtis, Queensland, whose cranial capacity was 1514 c.c.

The teeth were in a very good state of preservation, and, except for the right upper central incisor, all were present.

The crowns of the teeth of the molar and premolar series were very much ground down, as were also, but to a lesser degree, the canines and incisors.

The degree of usure of the teeth corresponded to No. 3 of Broca's[4] scale.

When the lower jaw was articulated with the upper, it was seen that in accordance with the observation of Sir William Turner,[5] the two sets of incisors were in contact by their free cutting edges.

That the crowns of the corresponding teeth of the upper and lower jaws in the majority of Australian skulls were not in the same vertical plane, was well borne out by the specimen shown. In this skull the crown of the lower wisdom-tooth projected somewhat behind the upper wisdom. The second molars were in almost a vertical plane, but the remaining molar and premolar teeth of the lower jaw were situated slightly in front of the corresponding upper teeth.

The alveolar or gnathic index was 103·8 mm., slightly above Prof. Flower's mean of 103·6 for 51 specimens examined. The skull therefore belonged to the prognathous group.

The mean gnathic index in Sir William Turner's specimens was 100·3 mm., making the average mesognathic. Two specimens, however, had the high gnathic indices of 108.

The width of the upper dentary arcade, between the first molar teeth, was 67 mm., the maximum of Sir William Turner's measurements of 18 skulls being 66 mm. The width taken between the second molars was 72 mm., being slightly below the 73 mm. maximum of Turner.[6] Between the wisdom-teeth the width of the arcade was 70 mm., Turner's maximum measurement in the same situation being 75 mm. The width of the lower dentary arcade, taken between the first molar teeth, was 61 mm., Turner's maximum being 63 mm.

[1] *Catalogue of Museum, Royal College of Surgeons*, Part I., Man.
[2] *Crania Ethnica.*
[3] *Voyage of H.M.S. Challenger—Report on the Human Crania.*
[4] *Instructions craniologiques et craniométriques.*
[5] *Jour. of Anat. and Phys.*, July 1891.
[6] *Ibid.*

Opposite the second molars the width was 66 mm., as compared with 69 of Turner's, and between the two lower wisdoms the width was 70 mm., Turner's maximum of 11 skulls measured exceeding it by 2 mm.

The measurements showed that the upper jaw exceeded the lower in width between the first molars by 6 mm., Turner's average measurement in the same situation being 5 mm.

Between the second molars, the excess of the upper over the lower jaw was also 6 mm., 4 mm. being Turner's average excess.

The antero-posterior measurement of the crowns of the molar and premolar teeth was, in the upper jaw on the right side, 51 mm.; on the left, 49; giving an average of 50 mm., being very close upon Turner's maximum of 51 mm.

In the lower jaw the measurements were on the right side 53 mm., on the left side 53 mm., Turner's maximum being 56 mm. The excess of the lower antero-posterior diameter over the upper was 3 mm., exactly the same as Turner's average excess, both for Australians and Europeans.

The antero-posterior measurement of the true molar series gave in the upper jaw on the right side 34 mm., on the left 33 mm., being an average of 33·5, somewhat below Turner's maximum of 36 mm.

In the lower jaw on the right side the antero-posterior diameter was 38 mm., and on the left side 38 mm., as compared with 40 mm. maximum of Sir William Turner.

The excess of lower over upper jaw in the antero-posterior diameter of crowns of the true molar teeth was 4·5 mm., Turner's average excess being 2·8, and his maximum excess being 5 mm.

Other measurements (all of which were taken with the help of Professor Thane) were :—

Dental index of Flower, . .	47·1 mm.
Symphysial angle, . . .	100°
Mandibular angle, . . .	120°

Mr A. Eichholz, B.A., communicated a paper on a *Racial Variation in the Length of the Palate Process of the Maxilla.* The paper is printed *in extenso* at p. 538 of the *Journal of Anatomy and Physiology.*

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PROCEEDINGS OF THE

ANATOMICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

AUGUST 1892.

THE Fourth Quarterly Meeting of the Session was held on August 2 at Edinburgh, in the Anatomical Theatre of the New Buildings of the University, the President, Sir William Turner, in the chair. Present—Thirteen members and visitors.

The minutes of the previous meeting were read and confirmed.

The Secretary reported that the members nominated to serve on the Committee to consider the methods of delimitation of the regions of the abdomen had consented to act.

A letter was read from the Executive of the XI. International Medical Congress, to be held in Rome in September 1893, inviting the co-operation of the members of the Society at the Congress.

The following gentlemen were nominated for election at the next meeting:—H. J. Waring, M.B., B.S., F.R.C.S., Assistant Demonstrator of Anatomy at St Bartholomew's Hospital, London, proposed by C. B. Lockwood, W. P. Herringham, G. H. Makins; and F. C. Kempson, B.A., Demonstrator of Anatomy at St George's Hospital, proposed by T. Pickering Pick, W. H. Bennett, H. D. Rolleston.

Professor Sir W. Turner, F.R.S. (President), exhibited the following specimens:—

a. The *Antlers of a Roe-deer* referred to by him at the last meeting of the Society in the discussion on Mr Bland Sutton's paper on the sebaceous glands present in the velvety covering of the antlers of that animal.

b. Some splendid specimens of *tattooed Skin* from an Irish American, æt. 29. He had been operated on by his brother when a boy from four to seven years of age, and the process of tattooing had occupied nearly three years. The whole surface of the skin except the face, hands, soles of feet, and front of pelvis was covered with most artistically executed designs in red and black, in which several Irish and American emblems were introduced. The man died of phthisis. The specimen was presented to the Museum of the University of Edinburgh by Dr J. Biggam.

c. A specimen showing *complete transposition of the viscera of the abdomen and thorax*, from the body of an old woman. The specimen was presented to the Museum of the University of Edinburgh by Dr Littlejohn.

Dr Symington showed *a horizontal section through the abdomen of a man aged 57 years, made at the level of the umbilicus and the disc between the 4th and 5th lumbar vertebræ.* The subject was very thin, and the anterior abdominal wall was depressed so that it came into close relation with the lower part of the abdominal aorta. The interest of the specimen was due to the fact that the large intestines were divided at the level of the ileo-cæcal orifice, which was closed by the distension of the cæcum with fæces and gas. As will be seen from the figure, the orifice was in the form of a nearly vertical slit,

I.D, Intervertebral disc between the 4th and 5th lumbar vertebræ. *C*, Cæcum *A*, Anterior flap of ileo-cæcal valve. *O*, Posterior flap of ileo-cæcal valve. *Ps*, Psoas muscle. *IL*, Ileum.

bounded by two flaps, anterior and posterior. The anterior flap did not reach quite so far to the right side as the posterior one. The latter lay against the posterior wall of the cæcum. From this case it appears probable that the passage of material from the large into the

small intestines is prevented by the two flaps at the ileo-cæcal orifice being pressed against one another, and against the posterior wall of the large intestines by the contents of the cæcum. The passage from the small to the large intestines therefore presents some resemblance to the oblique entrance of the ureters into the bladder, and the valvular action is of the same nature.

Dr Symington also exhibited *a Heart in which the anterior papillary muscle of the right ventricle presented an unusual arrangement.* The muscle, instead of ending where it gave off its chordæ tendineæ, was continued upwards on to the ventricular surface of the tricuspid valve, and its muscular fibres could be seen extending into the base of the valve. In this specimen there were also several distinct bundles of the columnæ carneæ passing directly to the ventricular surface of the valve near its base.

Professor Struthers showed the following preparations :—

1. *Two Knee-Joints having a complete septum in the femoro-tibial part of the joint.*—(*a*) In an adolescent subject. The free anterior border of the septum is in the usual position of the ligamentum mucosum, passing to the fore part of the intercondylar notch of the femur. Posteriorly, the septum reaches to the crucial ligaments, over which the two layers of synovial membrane that form the septum spread. There is but slight thickening of the anterior border. At the middle of the septum, on a level with the lower part of the attached base of the alar fatty mass, the septum contains a thickened bundle of tissue, above and below which the septum is translucent. Measurements of septum, vertically 1 inch, antero-posteriorly about the same, but the anterior third occupied by fat.—(*b*) An adult subject. The same arrangement. There is the same thickened bundle of tissue about the middle, interrupting the translucency of the septum. Measurements of the septum, vertically, $\frac{3}{4}$ inch behind, 1 inch in front; antero-posteriorly, $1\frac{1}{4}$ inch; no fat between the layers. Both of these were the knee-joint of the right side. The left joints were not preserved.

Following the existing nomenclature of the so-called ligament, the septum may be termed the *septum mucosum.* This variety may be regarded simply as a vestige of an early median septum between the two femoro-tibial joints, more complete than that remaining usually as the ligamentum mucosum. That so-called ligament, with the so-called ligamenta alaria, as Mr Bland Sutton remarks, is but a vestige of the septum which divided the knee-joint into three joints, the two femoro-tibial joints below and the femoro-patellar joint above, a condition persisting through life in some mammals. It appears uncertain whether the broad expansion of the synovial membrane above the patella should be regarded as derived from the primitive femoro-patellar sac or from the primitive bursa beneath the tendon of the rectus muscle.

2. Two specimens of *variation in the arrangement of the long flexor tendons in the sole of the foot.* (*a*) One, of the very rare condition in which the tendon of the flexor longus hallucis goes entirely to the great toe. (*b*) The other, of the condition in which, besides the usual tendon from the flexor longus hallucis to the neighbouring toes, the flexor longus digitorum gives a tendon to the great toe. The arrangement in the second of these specimens corresponds to that seen among the Quadrumana, in which the long common flexor of the quadruped is variously differentiated into two flexors more or less connected. In the first specimen the differentiation is completed, as in the normal condition in the human hand. The author referred to his remarks "On the error of regarding the 'flexor longus pollicis' pedis muscle of Man as, normally, a flexor of the great toe only" (*Edin. Med. Journ.*, 1863, p. 85). The present nomenclature tended to perpetuate the erroneous idea. As the internal one at the foot is external at the leg, the too common muscles cannot be named internal and external. They might be distinguished as "tibialis" and "fibularis," or the internal one at the foot might be termed "flexor longus hallucis et digitorum."

3. Preparation, showing the *Left Vertebral Artery arising from the arch of the aorta, and entering at the foramen of the fifth cervical vertebra.* Length of the artery before entering the foramen, 5 inches. Right vertebral artery arises normally, and enters normally at the foramen of the sixth vertebra. The author referred to a like case noted in his paper "On Variation of the Vertebræ and Ribs in Man" (*Jour. of Anat. and Phys.*, 1874, p. 26, Case 3), and showed two preparations, also there noted—one, in which the right vertebral artery entered first at the fourth vertebra, the foramen in the fifth and sixth being well formed (Case 4); the other (Case 2), in which the right vertebral artery arose last from the arch of the aorta, passed behind the œsophagus, and entered the foramen of the seventh vertebra. Besides that case, and another there noted (Case 1), in which the left vertebral arose from the subclavian nearly an inch earlier than usual and entered at the seventh foramen, the author could not in all his long experience recall any other instance in which he had seen a vertebral artery enter the foramen of the seventh cervical vertebra. Thus, although it is quite common to see the vertebral artery arising lower than usual, that of the left side homologically from the arch of the aorta, it is, notwithstanding, very rare to see it enter at the foramen of the seventh vertebra.

4. *Series of Preparations, showing Varieties of the Branches of the Abdominal Aorta.*

(*a*) Two specimens of very large anastomosis between the pancreatico-duodenal branch of the hepatic artery and the pancreatic branch of the superior mesenteric. In one, the anastomosing arteries form a large tortuous vessel, about 8 inches in length, nearly the size of a goose-quill, the hepatic end of the circle the larger. In the other specimen the anastomosing vessel is about a third less in diameter,

about 6 inches in length, the hepatic end of the circle also the larger. With the aorta and roots of the cœliac axis and superior mesenteric, a circle is formed in both specimens through which the closed hand could be passed.

(*b*) Preparation, from a large male subject, showing several varieties —(1) the *hepatic artery* arose entirely from the superior mesenteric; (2) a long tortuous *splenic artery*, about 9 inches in length before it divides; (3) the *coronary artery* arises from the splenic about half an inch after the origin of the latter from the aorta, their common trunk representing the cœliac axis.

(*c*) Preparation, showing several varieties—(1) the *coronary artery* arises directly from the aorta, $\frac{3}{4}$ inch above the cœliac axis; (2) the *superior mesenteric* arises entirely from the cœliac axis; (3) the *left spermatic artery* arises from the renal, $\frac{3}{4}$ inch out; the left renal arises $\frac{1}{4}$ inch further down than the right.

(*d*) Preparation, showing several varieties—(1) *two hepatic arteries*, of about equal size; one arises from the superior mesenteric, the other from the cœliac axis; (2) the latter, after a course of $1\frac{1}{2}$ inches, gives off the *coronary artery;* (3) the *gastroduodenal* arises from the cœliac axis, at the point of breaking up of the axis; (4) entire absence of the left *renal artery;* there was no left kidney.

(*e*) Variety in the *mode of branching of the superior mesenteric artery.* The earlier branches to the small intestine are large, and form wide primary arches, resembling the primary arches formed by its branches to the large intestine. There is an interval of $1\frac{1}{2}$ inches between the origin of the 4th and 5th branch to the small intestine, and after the origin of the 4th branch the trunk of the mesenteric is not larger than any of the three preceding branches to the small intestine. After the 5th, seven small branches are given to the small intestine.

(*f*) *Variety of the renal arteries.* The preparation shows, on the left side, two renal arteries arising close together, the lower about half the size of the upper, both entering the kidney by the hilum. On the right side, opposite to those of the left side, also two renal arteries, arising quite close together, of nearly equal size, one of them dividing unequally after a course of $\frac{1}{3}$ inch. A third right renal artery, of the same size as each of the two upper, arises 3 inches further down at about $\frac{3}{4}$ inch from the bifurcation of the aorta, passes up behind the ureter and enters the kidney below the hilum. Along with this the author showed one of the two specimens already noted by him (*Edin. Med. Journ.*, 1863, p. 759), in which a renal artery arose from the middle sacral. In the preparation now shown, each kidney has a supplementary artery, the right arising from the middle sacral, the left from the commencement of the common iliac, both passing to the lower part of their kidney behind the ureter. Three to four inches further up there are—for the left kidney, two arteries of unequal size, and close together; for the right kidney, one artery arising $\frac{1}{2}$ inch lower down than the two for the left kidney.

(*g*) *The arteries in two preparations of horse-shoe kidney.*—(1) In one there are two arteries for each lateral lobe, and a median artery for the isthmus part. The isthmus is formed simply by the running together of the lateral lobes, giving the figure V, and is the thickest part of the kidney. The median artery arises near the isthmus, and enters it in front. The arteries for the right lateral lobe arise two inches higher, close together, the upper one small. Of those for the left lateral lobe, one arises on the same level as those for the right kidney; the other, larger, arises an inch further down. (2) In this specimen the isthmus is narrow and long. The arteries, incompletely preserved, have been somewhat as in the last case, two for each lateral lobe, arising high up and close together, on nearly the same level on the two sides; and an artery is seen to enter the isthmus on the right side. The ureters, as usual, pass down in front of the isthmus in both the specimens.

5. *Three specimens of Double Ureter.*—(1) In one, the ureter is double in its upper third only. The arteries at the hilum lie mostly between the two ureters. (2) In the second, the ureters, of about equal diameter, are distinct until they are about to pierce the bladder, when they become united. At the hilum, the arteries are partly between the two ureters, partly in front of the anterior ureter. (3) In the third specimen, the ureters of both sides are preserved and fully injected. The right ureter is normal. On the left side there are two ureters, of about equal diameter, distinct throughout, entering the bladder by distinct apertures, close together. Each kidney has one artery, the left renal arising a little lower than the right, and larger than the right, as the left kidney also is. The divisions of the left artery enter the kidney partly in front, partly behind both ureters or pelves. On the right side the arteries enter partly behind the pelvis. In this specimen all of the three ureters show the decided dilatation on their last two to three inches, till close to the bladder.

6. *Transposition of the Common Iliac Veins and Vena Cava Inferior.*—In this specimen the common iliac veins cross behind the left common iliac artery; the vena cava lies to the left side of the aorta, and crosses obliquely in front of the aorta, below the root of the superior mesenteric artery, to gain the right side.

7. *Communications between the Vena Portæ and the Vena Cava in the Horse.*—In regard to this disputed question, Chauveau (*Comp. Anat. of the Domesticated Animals*, 2nd English ed., 1891) adheres to the opinion that the two systems do not communicate in the adult otherwise than by the capillaries; and that if any other communications exist, they must be extremely small. In this preparation, from an adult horse, the trunks of the vena portæ and posterior vena cava are seen to communicate directly by a transverse commissural vein, an inch in length and $\frac{1}{8}$ to $\frac{1}{6}$ inch in diameter, and by four antero-posterior veins, as large as a crow-quill, two from that com-

missural vein, two directly from the trunk of the vena portæ, to join a large tributary of the vena cava. The preparation was made for the author by the late Professor Barlow of the Edinburgh Veterinary School, a careful and thoughtful anatomist, and is submitted to the Society with the view of suggesting further research.

Professor A. M. Buchanan showed the *Kidneys, exhibiting well-marked lobulation, from a healthy woman* aged 26. The kidneys were shown not as coming under Meckel's statement, "that the lobulated structure has been sometimes carried so far as the point of giving a resemblance to several separate kidneys," but as apparently an advance on Henle's statement that "exceptionally the kidney is traversed by shallow furrows, which indicate a division into lobes which existed in an earlier stage of development. It is in the adult still betrayed by the internal structure of the organ."

The following note of the weights and measurements was appended :—

Right Kidney.		*Left Kidney.*
Weight, 4 oz. 1 drm.		Weight, 3 oz. 6 drms. 49 grs.
Difference, 1 drm. 11 grs.		
Length, . . .	$5\frac{3}{8}$ inches.	. . $5\frac{1}{8}$ inches.
Breadth at upper end, .	$2\frac{3}{8}$,,	. . $2\frac{1}{4}$,,
,, lower end, .	2 ,,	. . $2\frac{3}{4}$,,
,, centre of hilus in front, .	$2\frac{3}{8}$,,	. . 2 ,,
,, centre of hilus behind, .	$1\frac{3}{8}$,,	. . 2 ,,
,, upper part of hilus, .	$1\frac{1}{4}$,,	. . $2\frac{1}{4}$,,
,, lower part of hilus, .	$1\frac{3}{8}$,,	. . $1\frac{1}{4}$,,
Length of hilus in front,	$2\frac{5}{8}$,,	. . $1\frac{1}{8}$,,
,, ,, behind,	$2\frac{1}{8}$,,	. . $1\frac{1}{2}$,,

There was nothing abnormal as to the renal vessels. The adrenals were not noted.

The sulci which the kidneys present have in certain instances been rendered deeper than they actually were owing to the renal tissue having been somewhat torn on removing the capsule. This was done with great care under a gentle stream of water, but where the tearing took place the sulci were occupied by fat, and the capsule was unusually adherent.

Professor A. M. Buchanan also exhibited a specimen of the *Glass Bottles* he employs for the preservation of *Preparations*. The stopper

is ground, and consequently air-tight; it is provided with a glass hook on the under surface, which affords a simple mode of suspension. Specimens can easily, if necessary, be extracted from it, and the glass stopper may be made removable, if fixed, by placing a cloth wrung out in hot water around the neck.

Professor Cleland, F.R.S., communicated *A Contribution to the Comparative Anatomy of the Ankle-Joint.*

Dr Cleland pointed out in the hind limb of the Vulpine Phalanger the presence at the ankle of a tibial and fibular joint distinct one from the other; the tibial joint articulating with the upper surface of the astragalus, and continuous with the astragalo-calcaneal joint at its posterior and outer part, while the fibula was separated from this joint by a strong fibrous structure, which, followed downwards, was inserted into the outer side of the calcaneum, and might correspond with the middle band of the external lateral ligament of the ankle-joint in Man. Followed upwards, it was continued between tibia and fibula into a deep muscle belonging to the back of the leg, and whose fibres for the most part took a downward and inward direction from the fibula. Serial correspondence of this muscle with the pronator quadratus of human anatomy, and of the tendon between the joints with the triangular fibro-plate below the ulna, seemed possible. He showed the presence of a similar arrangement in Phascogale. Also, he demonstrated that in Ornithorhynchus the fibula was completely cut off from the astragalo-tibial articulation by a double fold of synovial membrane, and that a similar fold from behind existed in Echidna, but did not reach forward to the front. Dr Cleland regarded his communication as a preliminary notice of a larger investigation.

Professor Birmingham exhibited a *Specimen of Spina Bifida of the Cervical Vertebræ*, which was associated with an enormous enlargement of the foramen magnum, a cleft palate, and a para-occipital process, which projected downwards from the jugular process of the occipital, and articulated movably with the front of the transverse process of the atlas. A median suture existed, traversing the tabular portion of the occipital bone sagittally. The foramen magnum measured nearly 3 inches in the antero-posterior diameter. The enlargement was due entirely to a deficiency of the portion of the occipital bone which lies on the postero-lateral and posterior aspect of the foramen magnum, namely, its supra-occipital segment. Professor Birmingham was of opinion that the condition of the foramen magnum might be explained as an extension of the spina bifida (which was most complete above) to the first modified vertebra of the skull; and it might be considered as a bit of evidence in favour of the vertebrate theory of the skull.

Dr Musgrove gave a lantern demonstration of the arrangement of

the *blood-vessels and lymphatics of the retina* (see paper in the *Jour. of Anat. and Phys.*, vol. xxvi. p. 239).

Dr David Hepburn gave a microscopic demonstration of sections, illustrating the *development of diarthrodial joints.*

Professor Birmingham read a paper on a specimen of *Extreme Anomaly of the Heart, with history,* which will be found *in extenso* in the present number of the *Journal of Anatomy and Physiology*, p. 139.

Dr Musgrove read a paper *On the Costo-Sternal Articulations*, which will be found *in extenso* in the present number of the *Journal of Anatomy and Physiology*, p. 1.

Professor Struthers asked whether Dr Musgrove had noted any special characteristics dependent on the sex and age of the subjects examined, and Dr Musgrove said that sex and age had apparently no influence on the number of perfect joints existent.

Professor A. M. Buchanan communicated a paper on *The Use of Peroxide of Hydrogen for Cleaning Bones.*

Peroxide of hydrogen (H_2O_2), which was discovered in the year 1818 by Thenard, is a colourless, perfectly transparent liquid, having a strong bitter taste. It occurs sometimes in the atmosphere, in rain, in dew, and in snow.

The commercial kind is liable to contain, amongst other acids, hydrochloric acid. Its effect upon the skin is to whiten it. It may even produce a blister, accompanied by itching. It is a remarkable oxidising agent, and is particularly valuable for bleaching ostrich feathers, hair, ivory, silk, wool, teeth, &c. It is also antiseptic and disinfectant.

When a bone is placed in this liquid, what appears to be effervescence takes place. The bone soon becomes covered with bubbles of oxygen, and subsequently a film gathers upon the surface. It is advisable to remove this film carefully with a knife, because it is of a greasy nature; and after its removal the peroxide of hydrogen is allowed to take a grip of the bone. The bone being now replaced in the liquid, is allowed to remain until the requisite degree of whiteness is attained. In some cases, a few days will suffice (as in young bones); in other cases, three or four weeks may be required. Its ultimate effect is to render the bones perfectly free from smell, and of a pleasing white colour. It does not eat into the bone in the way that chloride of lime does. The liquid should never be raised to the boiling-point of water, becauses it then decomposes, with explosive violence, into oxygen and water. Young bones prepared in this way make beautiful preparations when subsequently mounted in a weak mixture of methylated spirits and water.

The cost of peroxide of hydrogen varies at different periods of the year. I have found it to be dearest about the pantomime season,

when it is largely used by theatricals for whitening their hair. It then costs 7s. 6d. per gallon. At present the cost is 5s. 6d.

When the bones are very greasy, the addition of a little dilute ammonia to the peroxide of hydrogen favours the cleaning process.

In illustration of the effects of this agent, I show the following specimens:—(1) mounted young radius; (2) interesting specimens of ossifying sternum; (3) a dried young humerus and ulna, in a glass jar; (4) lower end of adult fibula; (5) lumbar vertebra of hare.

THIRD ANNUAL REPORT OF THE COMMITTEE OF COLLECTIVE INVESTIGATION OF THE ANATOMICAL SOCIETY OF GREAT BRITAIN AND IRELAND FOR THE YEAR 1891–92.[1] Reported by Arthur Thomson, M.A., M.B., *Lecturer on Anatomy University of Oxford.*

The following questions were issued by the Committee of Collective Investigation early in October 1891 :—

1. Mode and place of origin of the middle sacral artery.
2. Frequency of the psoas parvus, and, if possible, to note the nerve-supply.
3. Arrangement of the branches arising from the arch of the aorta, with special reference to—
   (1) Origin of the brachio-cephalic and left common carotid arteries by a common trunk.
   (2) Dorsal origin of the right subclavian artery.
   (3) Origin of the left vertebral from the arch.
   (4) Other branches arising from the arch.
4. Frequency and arrangement of communication between the median (or anterior interosseous) and ulnar nerves in the forearm.

The Report compares favourably with that issued last year. Notices were sent to thirty-nine institutions, and replies have been received from nineteen. Through some mischance the notices forwarded to Charing Cross Hospital Medical School, the School of Medicine for Women, and the Middlesex Hospital Medical School were not received, and the secretary has letters from Messrs Stanley-Boyd and Gordon-Brodie, expressing regret that they have been unable to contribute to this year's report.

These facts prove that the interest in the work is still maintained, and the Committee look forward to a continuance of the support they have already received.

Subjoined is a list of the schools to which notices were sent. An asterisk is placed opposite those from which returns have been received :—

[1] The Second Annual Report appeared in the *Journal of Anatomy and Physiology,* vol. xxvi., October 1891.

*St Bartholomew's Hospital, London.
Charing Cross Hospital, London.
*St George's Hospital, London.
Guy's Hospital, London.
King's College, London.
London Hospital, London.
*St Mary's Hospital, London.
Middlesex Hospital, London.
*St Thomas' Hospital, London.
*University College, London.
*Westminster Hospital, London.
London School of Medicine for Women.
Cook's School of Anatomy.
*University of Oxford.
*University of Cambridge.
*Queen's College, Birmingham.
Bristol Medical School.
*School of Medicine, Yorkshire College, Leeds.
*School of Medicine, University College, Liverpool.
*The Owens College, Manchester.
Medical School, Firth College, Sheffield.
*University of Durham School of Medicine, Newcastle-on-Tyne.
*University of Edinburgh.
School of Medicine, Royal College of Surgeons, Edinburgh.
School of Medicine, Minto House, Edinburgh.
University College, Dundee.
School of Medicine for Women, Edinburgh.
*University of Aberdeen.
*University of Glasgow.
Anderson College, Glasgow.
St Mungo's College, Glasgow.
Western Medical School, Glasgow.
*School of Physic, Trinity College, Dublin.
Carmichael School of Medicine, Dublin.
*Catholic University School of Medicine, Dublin.
Royal College of Surgeons, Ireland.
*Queen's College, Belfast.
Queen's College, Cork.
Queen's College, Galway.

REPORT.

Question I.

Mode and place of origin of the middle sacral artery.

To this question replies have been received from the following gentlemen, representing different schools:—

Messrs E. Knight, The Owens College, Manchester; G. Jamison, Trinity College, Dublin; J. Yule Mackay, University of Glasgow; J. M. Martin, University of Cambridge; W. Thelwall Thomas, University College, Liverpool; Lockhart Lowe, Queen's College, Birmingham; C. G. B. Kemp, University of Durham Medical School, Newcastle-on-Tyne; W. P. Herringham, St Bartholomew's Hospital, London; J. W. Crerar, University of Edinburgh; John Campbell, Queen's College, Belfast; H. G. Lawrence, St Mary's Hospital, London; Edward Fawcett, Yorkshire College, Leeds; F. Kenneth Wilson, Westminster Hospital, London; F. G. Parsons, St Thomas' Hospital, London; and the University of Oxford.

Records in all of 400 cases have been received, and after analysis have been arranged in nine classes, as figured A, B, C, D, E, F, G, H, I in the accompanying diagram. Appended to each figure is the number of cases noted, with, in most instances, the percentage of occurrence.

Little requires to be added in explanation of the figures, except *to note particularly that it is the posterior surface of the aorta that is represented :* this view of the vessels was adopted as being more convenient for the representation of the various modes of origin of the middle sacral artery.

Fig. A includes all those cases where the middle sacral artery took origin at a point $\frac{1}{8}$ of an inch and upwards from the bifurcation of the aorta. From the data furnished by the various observers,

20 per cent. of the instances recorded in fig. A arose at a point about $\frac{1}{8}$ of an inch or 3 mm. distant from the bifurcation.

44 per cent. at a point about $\frac{1}{4}$ of an inch or 6 mm. from the bifurcation.

30 per cent. at a point $\frac{1}{2}$ an inch or 12·5 mm. from the bifurcation ; and

6 per cent. at a point $\frac{3}{4}$ of an inch or 19 mm. from the bifurcation.

Instances were also recorded where the artery arose from the parent stem as high as 1 inch or 25 mm. above the bifurcation.

Fig. B includes all those examples in which the artery arose *within* an $\frac{1}{8}$ of an inch or 3 mm. of the bifurcation. It has been very rare indeed to find the artery arising just at the point of division of the aorta, and only one case is recorded of this condition.

Fig. C includes those cases in which the middle sacral arises in common with the fourth lumbar arteries. The point of origin of this common trunk averaged about 10 mm. from the bifurcation of the aorta. As a rule, the fourth lumbar arteries are the vessels associated with the origin of the sacra media ; but Mr Lockhart Lowe, of Queen's College, Birmingham, records a case in which it arose in common with the third lumbar branches. No mention is made as to whether a fourth pair was present.

In fig. D, of which we have eighteen examples, it may be noted that the origin of the sacra media is much more common from the *right* fourth lumbar than from the *left.* Compare fig. G, of which there are only 2 cases, with fig. D. On the other hand, it is interesting to note that the middle sacral artery arises more frequently from the left common iliac (fig. E) than from the right common iliac artery (fig. F).

The case represented in fig. H is recorded by Mr E. Knight, of the Owens College, Manchester; and Mr H. G. Lawrence, of St Mary's Hospital, London, gives the following details in regard to fig. I :— "The middle sacral arose $\frac{1}{2}$ an inch above the bifurcation, divided into two about $1\frac{1}{2}$ from its origin, each branch coursing laterally on either side of the sacrum."

Mr D. M. Martin, B.A., of Cambridge, records a case where three pairs of lumbar arteries arose from a common stem on the right side of the aorta, 4 cm. above its bifurcation.

Mr Lockhart Lowe, of Queen's College, Birmingham, describes a condition in which the sacra media, arising as shown in fig. C, was displaced along with the left lumbar artery to the right side, so that before it could reach its normal position it had to pass obliquely behind the right common iliac artery.

Dr Crerar, of the University of Edinburgh, in discussing the condi-

TABLE I.—*Variation in the Mode and Place of Origin of the Middle Sacral Artery. Total number of Cases examined* 400.

A 230 cases 57 %

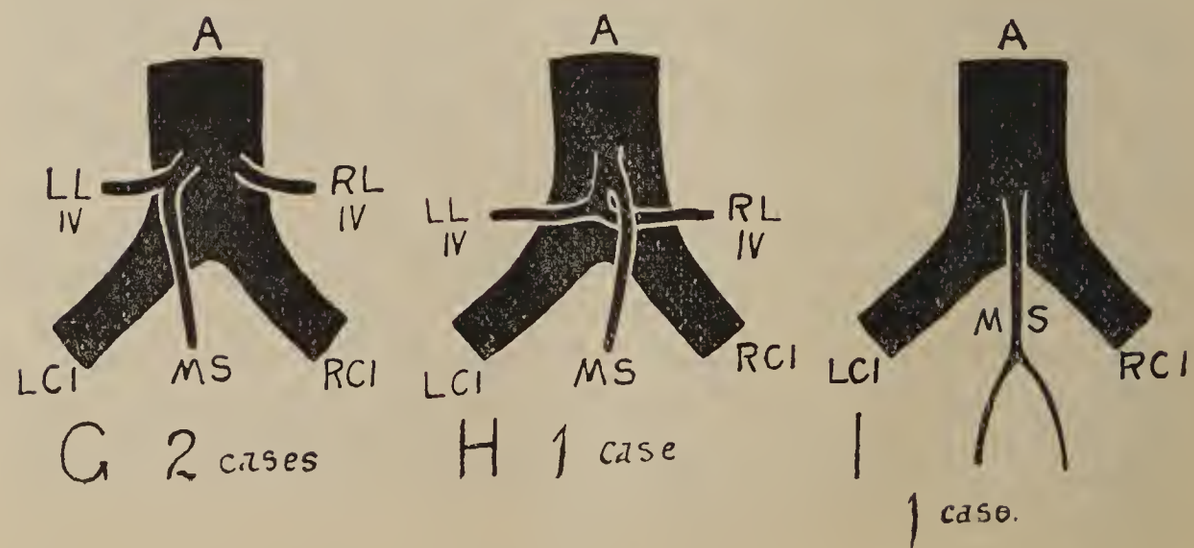
B 90 cases 22 %

C 38 cases 9 %

D 18 cases 4·5 %

E 16 cases 4 %

F 4 cases 1 %



G 2 cases

H 1 case

I 1 case.

tion figured at C, writes as follows:—"In only one subject could it be said that the middle sacral artery arose by a common trunk with the lowest pair of lumbar arteries: in the majority of cases the lowest pair of lumbar arteries took origin from the middle sacral artery." Dr Crerar, however, furnishes no details as to the number of pairs of lumbar arteries in each subject.

Dr John Campbell, of the Queen's College, Belfast, in discussing the relation of the point of origin of the sacra media to the vertebral column, furnishes the following details of 21 cases examined:—

3	arose from the aorta opposite the disc between III. and IV. L.V.	
6	opposite the upper border of the IV. L.V.	
6	,,	middle of the IV. L.V.
3	,,	lower border of the IV. L.V.
1	,,	disc between IV. and V. L.V.
2	,,	upper border of V. L.V.

Dr Campbell furnishes notes that in 5 cases in which the sacra media gave off the 5th pair of lumbar arteries, the lumbar arteries of the fourth vertebra had an origin by a common trunk.

Mr F. G. Parsons, of St Thomas' Hospital, in one instance was unable to find the slightest trace of a middle sacral artery.

Explanation of Table I.

A., aorta.
R.C.I., right common iliac.
L.C.I., left common iliac.
M.S., middle sacral.
R.L. and L.L., right and left fourth lumbar respectively.

Some of the observers furnished details of the sex of the subjects examined; but as the information on this point is somewhat scant, it has not been thought necessary to embody it in the present report, nor do the details furnished appear to have influence on the final results.

Question II.

Frequency of the psoas parvus, and, if possible, to note the nerve-supply.

The following gentlemen have contributed reports on this question:—

Messrs F. G. Parsons, St Thomas' Hospital, London; H. G. Lawrence, St Mary's Hospital, London; A. F. Dixon, Trinity College, Dublin; H. L. Sutherland, University of Aberdeen; F. K. Wilson, Westminster Hospital, London; Edward Fawcett, Yorkshire College, Leeds; John Campbell, Queen's College, Belfast; J. W. Crerar, University of Edinburgh; W. P. Herringham, St Bartholomew's Hospital, London: C. G. B. Kemps, University of Durham Medical School, Newcastle-on-Tyne; G. J. Branson, Queen's College, Birmingham; H. C. Phillips, University of Cambridge; George Lamb, University of Glasgow; D. Drew, University College, London; M. T

Dempsey, Medical School, Catholic University, Dublin; E. Knight, The Owens College, Manchester; and A. Thomson, University of Oxford.

The general result is tabulated below, and requires no further explanation.

TABLE II.—*Frequency of occurrence of the Psoas parvus.*

Total Number of subjects examined.	Muscle absent.	Muscle present.		
457	270	187		
		Both sides. 139, or 30 per cent.	Right side. 27, or 6 per cent.	Left side. 21, or 5 per cent.
Percentage. 100	59 per cent.	41 per cent.		

Particulars were furnished regarding the sex in 174 instances. Of these, 105 were males and 69 females. The muscle appears to be more frequently absent in the female than in the male.

The percentages are as follows:—

	Male.			Female.		
Muscle absent	54	. . .		65		
„ present	46	. . .		35		
		Both sides	35		Both sides	22
		Right „	6		Right „	4
		Left „	5		Left „	9
			46			35
Total,	100			100		

The returns from the Irish and Scotch schools and the London hospitals were treated separately, with the result that the presence of the muscle was noted in 34 per cent. of the Irish returns, in 37 per cent. of the Scottish, and in 50 per cent. of the London subjects. It must, however, be borne in mind that any conclusions based on these facts are open to grave doubt, as the class from which subjects are obtained is very mixed both in Scotland and in England. The higher percentage in the London returns was noted, however, and it was thought that the fact was worth recording.

Mr C. G. Kemps describes one example of the muscle which he saw as "inserted into a fibrous band which extended from the IV. lumbar vertebra to the ilio-pectineal line."

In regard to the nerve-supply of the psoas parvus muscle, there are 108 records of its being carefully examined and traced. The subjoined list is an analysis of the returns:—

Nerve-supply of the Psoas parvus.

From the XII. dorsal nerve,	2	cases
„ loop between XII. dorsal and I. lumbar,	2	„
„ I. lumbar nerve,	36	„
„ loop between I. and II. lumbar nerves,	28	„
„ genito-crural nerve,	7	„
„ II. lumbar nerve	27	„
„ loop between the II. and III. lumbars,	6	„
	108	„

In one or two cases more than one twig passed to the muscle; these were derived from the I. and II. lumbar nerves respectively.

The nerve-supply of the muscle frequently varied on different sides of the same subject. Mr G. J. Branson, B.A., of Queen's College, Birmingham, noted the presence of a well-marked sympathetic branch joining the twig which went to the muscle from the I. lumbar nerve.

Question III.

Variation in the arrangement of the branches arising from the arch of the aorta.

In reply to this question, the Secretary has received reports from the following gentlemen:—

Messrs Montague Griffin, Trinity College, Dublin; L. S. Giles, University of Cambridge; J. Yule Mackay, University of Glasgow; Percy Fleming, University College, London; Wm. Dargan, Medical School, Catholic University, Dublin; T. T. Jeans, The Owens College, Manchester; John Campbell, Queen's College, Belfast; Edward Fawcett, Yorkshire College, Leeds; F. K. Wilson, Westminster Hospital Medical School, London; F. G. Parsons, St Thomas' Hospital Medical School, London; W. P. Herringham, St Bartholomew's Hospital Medical School, London; C. K. Bryant, University of Durham Medical School, Newcastle-on-Tyne; Lockhart Lowe, Queen's College, Birmingham; G. H. Clarkson, St George's Hospital Medical School, London; W. T. Thomas, University College, Liverpool; J. W. Crerar, University of Edinburgh; H. L. Sutherland, University of Aberdeen; A. Thomson, University of Oxford.

The arrangement of the branches of the arch of the aorta was noted in 500 cases, and, as a result of the inspection of the returns, the varieties have been grouped in 8 classes figured A, B, C, D, E, F, G, and H respectively in the accompanying diagram. The condition described as normal occurs in 82 per cent. of the cases examined, though here considerable variation is noted in the distance between the origins of the arterial trunks as they spring from the parent stem.

In Class B the length of the trunk common to the right subclavian, right common carotid, and left common carotid varied in length from zero to $1\frac{1}{4}$ inches. The average length, however, did not exceed $\frac{1}{2}$ an inch.

In Class C the left vertebral artery was seen entering the vertebr-arterial foramen in the IV. cervical vertebra in two cases—the V.

in 4, and the VI. in 1: the fact was noted that in several instances it was joined by an accessory branch from the left subclavian.

No remarks are necessary in regard to Classes D, E, and F: the diagrams sufficiently explain themselves.

The examples represented in figures G and H were exhibited at a meeting of the Anatomical Society by Mr F. C. Abbott, of St Thomas' Hospital, and a detailed description of them will be found in the *Proceedings of Anat. Soc. of Great Britain and Ireland* for Feb. 1892.

Appended are some notes by the individual observers:—

Mr Montague Griffin, M.B., of Trinity College, Dublin, notes two cases in which the brachio-cephalic trunk arose from the ascending part of the arch and passed vertically upwards parallel to and to the right side of the trachea, whilst the left common carotid arose from the most anterior part of the transverse arch and passed obliquely upward and to the left, crossing the trachea in the middle line. In the first subject this point was $1\frac{1}{3}$ inches, in the second $1\frac{1}{4}$ inches above the level of the arch.

Mr L. S. Giles, B.A., University of Cambridge, notes the occurrence of a large vas vasorum to the pulmonary artery in one instance.

Dr Herringham, of St Bartholomew's Hospital, records a case where the left vertebral arose from the left common carotid $\frac{5}{8}$ of an inch above its origin.

Mr C. H. Bryant, of the Medical School, Newcastle-on-Tyne, mentions an instance, in a female subject, of a left bronchial artery springing from the posterior part of the arch, close to the ductus arteriosus; in three other subjects, bronchial and mediastinal branches were seen arising from the descending part of the arch; and four cases are recorded of the origin of the thyroidea ima from the innominate artery.

Mr G. A. Clarkson, of St George's Hospital, London, in his account of a case of root-origin of the right subclavian classed in Group D, gives the following details:—

"The artery (right subclavian) arose from the posterior aspect of the descending part of the aortic arch $\frac{1}{2}$ an inch below the origin of the left subclavian . . . . its length from origin to the first branch (vertebral) was 3 inches . . . . . the ductus arteriosus was pervious, and the inferior laryngeal nerve was not recurrent."

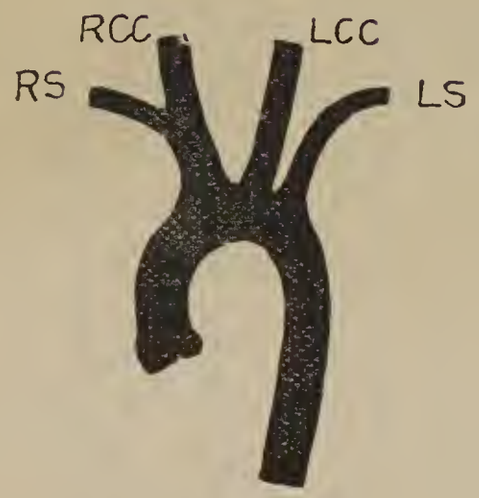
Mr W. Thelwall Thomas, F.R.C.S., of University College, Liverpool, describes a large mediastinal branch which arose from the front of the arch between the innominate and left common carotid arteries, and coursed downwards in the fat of the mediastinum for $4\frac{1}{2}$ inches.

Dr Crerar, of the University of Edinburgh, also mentions a case in which a bronchial artery arose from the back of the arch, just below the origin of the left subclavian.

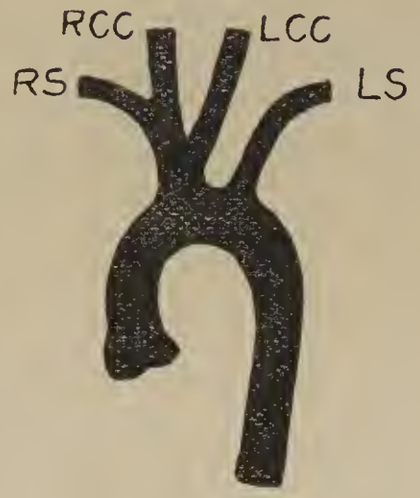
The figures in Table III. are lettered as follows:—

R.S., Right subclavian.
R.C.C., Right common carotid.
L.C.C., Left common carotid.
L.S., Left subclavian.
L.V., Left vertebral.
R.V., Right vertebral.
T.I., Thyroidea ima.

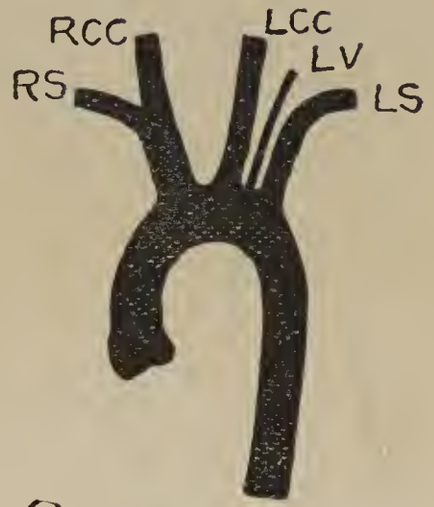
TABLE III.—*Variations in the Mode of Origin of the Branches arising from the Arch of the Aorta.*
Total number examined 500.



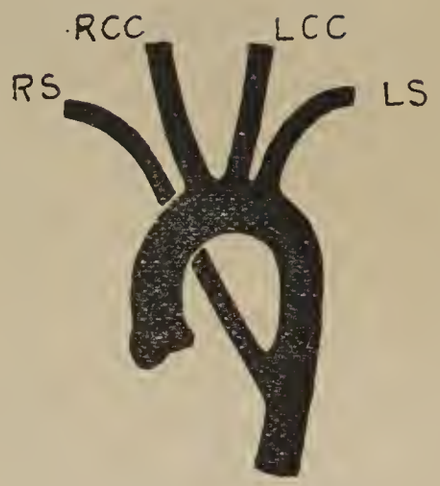
A. 412 cases or 82 %



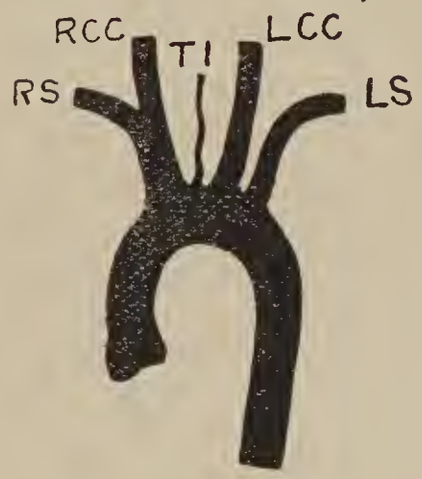
B 51 cases or 10 %



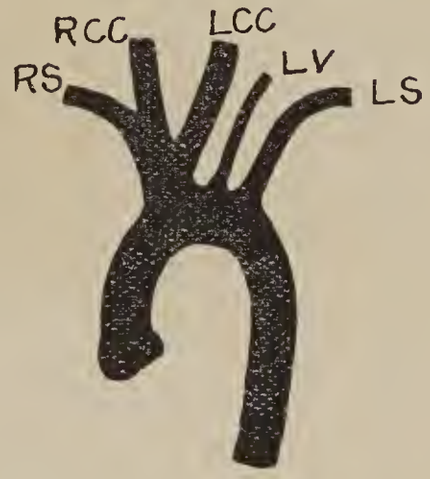
C 27 cases or 5 %



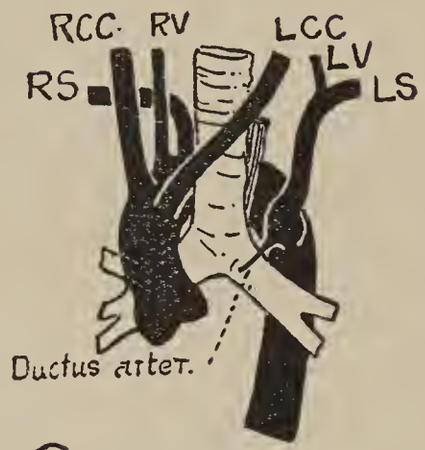
D 4 cases or .8 %



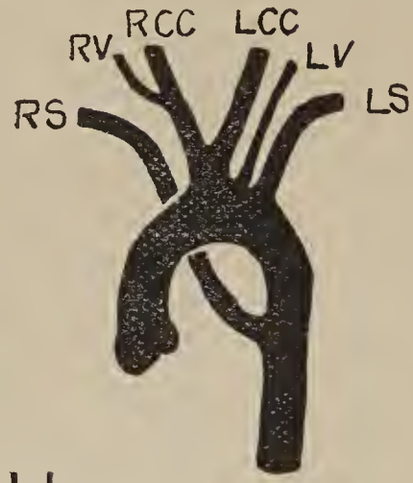
E 2 cases



F 2 cases



G 1 case



H 1 case

In each figure the number of such cases met with is recorded, and the percentage of occurrence given.

Question IV.

Frequency and arrangement of communication between the median (or anterior interosseous) and ulnar nerves in the forearm.

The answers to this question were not so numerous as to the others. The difficulties of observation were no doubt greater, but notwithstanding reports have been received which yield a total of 406 forearms examined.

The gentlemen to whose assistance we are indebted are—

Messrs Richard Smith, Trinity College, Dublin; T. T. Jeans, The Owens College, Manchester; A. K. Gordon, University of Cambridge; P. J. Fagan, Medical School, Catholic University, Dublin; John Campbell, Queen's College, Belfast; J. W. Crerar, University of Edinburgh; W. T. M. Whitling, University of Durham Medical School, Newcastle-on-Tyne; H. L. Sutherland, University of Aberdeen; and A. Thomson, University of Oxford.

Out of 406 forearms examined a communicating branch was noted in 63 instances, or about 15 per cent.

The results are classified into four varieties.

Class I., of which 33 examples were noted out of the 406 cases examined, yielding a percentage of occurrence of 8 cases per hundred, was as follows:—The branch of communication which arose from the *anterior interosseous* at a point varying from the commencement of that nerve to a spot $2\frac{1}{2}$ inches down its trunk, coursed downwards with a varying degree of obliquity and lay behind the ulnar artery, resting on the flexor profundus digitorum and being crossed superficially by the muscles springing from the internal condyle, with the exception of the flexor carpi ulnaris: it usually joined the ulnar nerve at a point corresponding to the junction of the upper and middle thirds of the forearm.

Class II., of which, out of the total of 406 cases examined, there were 12 instances recorded, or an average of about 3 per cent., differed from Class I. only in the fact that the communicating branch arose directly from the *median* in place of the *anterior interosseous*, otherwise its course and relations were the same, except in one instance recorded by Mr A. K. Gordon, B.A., of Cambridge University, in which case the ulnar artery lay *behind* the nerve in place of in front, as described in Class I.

Class III. includes 16 cases out of the total of 406, or rather under 4 per cent., in which the communicating branch was formed by a junction between the filaments of nerve supplying the flexor profundus digitorum: in this way a loop was formed which underlay the ulnar artery, the convexity of which was directed downwards.

Appended is Mr P. J. Fagan's description of this condition as observed in the cases reported by him. Mr Fagan writes:—

"In seeking for communications between the ulnar and median

nerves, I observed the following method as far as possible. Before the forearm had been dissected, I cut the anterior head of the flexor carpi ulnaris, and traced the branches of the ulnar nerve lying on the flexor profundus digitorum. I then traced the offsets of the median to the ulnar artery; and at a later stage in the dissection, noted the lower part of the ulnar. In all, I collected 17 examples. In four instances I failed to find any communication; in the remaining thirteen, communications were established. There were few variations, the usual arrangement being, a twig from the ulnar lying on the flexor profundus digitorum ran to the posterior aspect of the ulnar artery, and, at that place, anastomosed with a twig from the median. When traced with a little care the plan of the nerves proved to be this :—As soon as the ulnar had passed between the heads of the flexor carpi ulnaris it gave off a slender branch, which ran downwards and outwards on the flexor profundus digitorum muscle, to which it furnished a small twig, and then beneath the ulnar artery, where it joined the branch from the median. The branch from the median, in some cases, emerged from the substance of the flexor sublimis digitorum; in others, it came under that muscle. It usually divided into two twigs: one entered the flexor profundus digitorum, the other joined the ulnar twig, forming an arch with its convexity downwards. From this arch a varying number of twigs arose. In two cases the number was three: two short, entering the muscle almost immediately; one long, arising by two heads, and extending as low down as midway between the elbow and wrist, where it supplied the part of the muscle for the middle and ring fingers. In one case where the usual communication did not obtain, I found a very large branch low down coming from the ulnar to the median.

"On the whole, I am inclined to think that the variations in the twigs depended rather on the condition in which I found the part than on the actual state of affairs, and that the usual arrangement is for the ulnar alone to supply that part of the flexor profundus destined for the little finger; the median, the part for the index finger; and the arch formed by the ulnar and median, the remaining two fingers."

Class IV. includes only 2 examples out of a total of 406. These cases which came under the notice of Mr T. T. Jeans, of the Owens College, Manchester, are thus described by him :—"The communication was by a superficial branch which left the median at the bend of the elbow, passed across the muscles rising from the internal condyle (except the flexor carpi ulnaris), and joined the ulnar nerve in the lower third of the forearm.

The results may be summarised as follows :—

Total number of cases examined, 406.

Class I.

Communication between anterior interosseous and ulnar . . . . 33, or 8 per cent.

Class II.

Communication between median and ulnar trunks . . . . 12, or 3 „

Class III.	
Communication between muscular twigs to flexor profundus . . .	16, or 4 per cent.
Class IV.	
Communication by means of a superficial branch	2, ,, ,,
Total, . . .	63, or 15 per cent.

Some extracts from the reports are added.

Mr T. T. Jeans, of The Owens College, reports that he only saw the communication between the anterior interosseous and ulnar nerves in both arms of the same subject in one instance, a female.

Dr John Campbell, of the Queen's College, Belfast, mentions a case in which the slender communication joined the ulnar palmar cutaneous branch, and describes, in three of the instances recorded, how the communicating twig from the median trunk arose in connection with its muscular offsets, pierced the flexor sublimis digitorum, and joined the ulnar nerve in his upper third of the foramen.

In 5 of the subjects examined by Dr Crerar, of Edinburgh University, the communication was present on both sides. In one case the communication took place in the fibres of the flexor sublimis digitorum. The communicating branch varied in size from the thickness of thread to that of small whipcord, and in length from 3 to 9 cm. In one of the subjects examined a twig was given off from the branches of the ulnar nerve to the flexor profundus, which, passing behind the ulnar artery, did not communicate with the anterior interosseous nerve, but recurved over the artery, to be distributed to the flexor sublimis digitorum near the internal condyle of the humerus. From this twig a small condylar muscular branch of the flexor profundus received a branch of supply in addition to a larger one which it received from the anterior interosseous nerve.

Dr Crerar concludes by stating that Professor Sir W. Turner has recorded a case of supply of the flexor sublimis digitorum by two twigs from the ulnar nerve (*Nat. Hist. Rev.*, 1864).

In conclusion, the Committee desire to place on record their sincere thanks to those gentlemen who have so kindly assisted them in the publication of the present report.

The Secretary will at all times be pleased to receive suggestions with regard to subjects for future inquiry. Communications may be addressed to him at the Department of Human Anatomy, Museum, Oxford.

Rules and List of Members

OF THE

ANATOMICAL SOCIETY OF GREAT BRITAIN AND IRELAND.

MAY, 1892.

LONDON:
PRINTED BY
ADLARD AND SON, BARTHOLOMEW CLOSE.

1892.

CONSTITUTION.

1. That the name of the Society be "The Anatomical Society of Great Britain and Ireland."

2. "That the object and scope of the Society be the Anatomy, Embryology, and Histology of Man and of Animals in so far as they throw light upon the structure of Man."

3. That the officers of the Society shall consist of a President, three Vice-Presidents, a Treasurer, a Council of twenty, and three Secretaries.

4. That the officers be elected by ballot at each annual meeting.

5. That as far as possible, in the election of President and Vice-Presidents, there shall be two representatives of England and one each from Scotland and Ireland.

6. That there shall be a Secretary for England, one for Scotland, and one for Ireland.

7. That the Council shall, from amongst their number, select six members to form, together with the President, Vice-Presidents, Treasurer, and Secretaries, a Committee of Management.

RULES.

1. Those interested in the science of Anatomy shall be eligible for election as Members of the Anatomical Society of Great Britain and Ireland.

2. Candidates shall be proposed by three members, of whom one shall have personal knowledge of the Candidate.

3. The name and address of each Candidate, together with the names of his proposers, shall be announced at a meeting of the Society, and the ballot shall take place at the next meeting.

4. Not less than one full week before the meeting at which the ballot is to take place, the Secretary shall send to every member of the Society the name and address of each Candidate, together with the names of his proposers.

5. Any member wishing to vote shall return to the Secretary, on or before the day of meeting, this notice with the name of any Candidate to whom he objects crossed out.

6. One black ball in five shall exclude.

7. Each member of the Society shall pay an annual subscription of Ten shillings and sixpence.

8. The subscription is payable in advance, and becomes due on the 1st of November of each year.

9. Any member whose subscription is not paid within twelve months after it has become due, shall, if the Council see fit, be removed from the membership of the Society.

10. The Committee of Management shall fix the time and place of each meeting.

11. The Committee of Management shall determine the business of each meeting.

12. Each member shall have the privilege of introducing a visitor or visitors at any ordinary meeting of the Society. The names of visitors shall be entered into the attendance book, after which the visitors shall be permitted to join in the discussions of the Society.

13. The first meeting of the Society in the winter session shall be the Annual General Meeting.

14. One fourth of the members of the Council shall be replaced at each annual meeting by an equal number of members chosen from the Society at large.

15. One Secretary shall retire in each year.

16. The Council shall submit at each annual meeting a list of the members whom they recommend as officers during the ensuing year.

17. The Committee of Management shall arrange with the 'Journal of Anatomy and Physiology' for the publication of the Proceedings of the Society, and of the papers read before the Society.

18. If at any time the Council shall be of opinion that the interests of the Society require the expulsion of a member, they shall submit the question to a Special General Meeting, at which, if two thirds of the members of the Society vote for the expulsion of the member in question, his subscription for the current year shall be returned to him, and he shall thereupon cease to be a member of the Society. The voting at such special meetings shall be by ballot, and not less than twenty members shall form a quorum.

19. New Laws may be proposed by the Council at the

annual meeting of the Society, or at a meeting specially summoned for the purpose, notice of the proposal being sent to each member of the Society with the summons to the meeting. At such meeting not less than twenty members shall form a quorum, and for the adoption of any rule a majority of two thirds of the members present shall be required in its favour.

20. Any member may make suggestions to the Council regarding changes in the laws, by letter addressed to the Secretaries.

21. Papers read before the Society become the property of the Society, and in the event of it being decided not to publish a paper it may be returned to the author by the Secretary. Further, after the publication of a paper any original drawings illustrating the same shall be returned to the author.

22. The Council are empowered to nominate a limited number of persons, who have distinguished themselves in promoting the science of anatomy, for election as honorary members of the Society. The election shall take place at an Annual Meeting, and a list of the nominations shall be sent to each member with the notice of the meeting.

1893. Blacker G. F. M.B. B.S. ~~University College~~ ~~Hospital W.C~~

20 Weymouth St Portland Place

List of Members.

ELECTED.

1890 Abbott, F. C., St. Thomas's Hospital, S.E.

O.M. Abraham, Phineas S., M.D., 2, Henrietta Street, Cavendish Square.

O.M. Anderson, Wm. (*Council*), 2, Harley Street, W.

1890 Andrewes, F. W., M.D., 15, Upper Brook Street, Grosvenor Square, W., and St. Bartholomew's Hospital, E.C.

1890 Balgarnie, W., 47, South Molton Street, W.

O.M. Banks, W. Mitchell, M.D., 28, Rodney Street, Liverpool. (*C.* 1887-90.)

O.M. Beddard, Frank E., Zoological Society's Gardens, Regent's Park, London, N.W. (*C.* 1887-90.)

1887 Bennett, E. H., 26, Lower Fitzwilliam Street, Dublin.

O.M. Bennett, W. H. (*Council*), 1, Chesterfield Street, Mayfair, W.

O.M. Berry, Jas., 60, Welbeck Street, Cavendish Square, W.

1887 Birmingham, Ambrose, M.B. (*Secretary for Ireland*), Medical School, Catholic University, Cecilia Street, Dublin.

O.M. Black, James, 2, Princes Mansions, Victoria Street, S.W. 16 Upper Brook Street. W.

1889 Bowles, R. L., M.D., ~~West Terrace, Folkestone~~.

1888 Boyd, Stanley (*Council*), 134, Harley Street, W.

1888 Brodie, Gordon C., 30, Harley Street, W.

O.M. Brooks, H. St. John, M.D., ~~School of Physic, Trinity College~~, Dublin. (*S.* 1888-90.) 52 Lower Mount St

1888 Broomfield, Humphry, Carmichael College, Dublin.

ELECTED.

O.M. Brown, Macdonald, Apsley Lodge, The Grange, Edinburgh.

O.M. Buchanan, Prof. A. M., M.A., M.D., 98, St. George's Road, Glasgow. 93. Wimpole Street W.

1888 Cagney, James, M.D., ~~11, Welbeck Street, W.~~

1888 Cadman, A. W., King's College, Strand.

1888 Charles, Prof. J. T., Queen's College, Cork; and The Crescent, Port Stewart, Co. Derry. (*C.* 1889-91.)

O.M. Clarke, J. J., ~~St. Mary's Hospital, and 8, Harewood Street, W.~~ 50 Oxford & Cambridge Mansions W.

O.M. Clarke, W. Bruce, M.A., M.B., 46, Harley Street, W.

O.M. Cleland, John, M.D., F.R.S. (*Council*), 2, The College, Glasgow.

O.M. Collins, Wm. J., M.D., 1, Albert Terrace, Regent's Park, N.W.

O.M. Cook, Thomas, 40, Brunswick Square, W.C.

1892 Cotterell, E., 5, Halkin Street West, Belgrave Square, S.W.

O.M. Cunningham, D. J., M.D., F.R.S. (*Council*), School of Physic, Trinity College, Dublin. (*V.-P.* 1887-91.)

O.M. Curnow, J., M.D. (*Vice-President*), 3, George Street, Hanover Square, W. (*C.* 1887-90.)

O.M. Curtis, James, Western Medical School, Glasgow.

? — O.M. Dane, R., Middlesex Hospital, W.

~~O.M. Davies-Colley, J. N., 36, Harley Street, W. (*C.* 1887-90.)~~ Resigned 10/4/93

1891 Dean, Percy, London Hospital, E., and 60, Gower Street, W.C.

1889 De Renzi, H. C., 7, Cockerton Road, Upper Tooting, S.W.

1888 Douty, E. H., Demonstrator of Anatomy, 60, St. Andrew's Street, Cambridge.

1888 Duncan, H., M.B., Shaftesbury Mansion, Shaftesbury Avenue, W.

1889 Dunn, L. A., M.B., 10, St. Thomas's Street, S.E.

1891 Fawcett, E., M.B., C.M., Yorkshire College, Leeds.

1893. Dixon. A. Fras. M.B. School of Physic
Trinity College Dublin

1893 Eccles. W. McAdam M.B. B.S. F.R.C.S
10 Welbeck Street. W.

ELECTED.

1887 FLEMMING, PERCY, ~~35, Regent's Park Road~~ 88 Gower Street. W.C.

O.M. FRASER, ALEX., M.B., Royal College of Surgeons, Dublin.

O.M. FREEMAN, R. AUSTIN, Middlesex Hospital, W.

O.M. GADOW, H., Ph.D., M.A., Museum of Zoology and Comparative Anatomy, Cambridge; Strickland Curator, Museum, Cambridge.

O.M. GALTON, JOHN C., New University Club, St. James's Street, S.W.

O.M. GODLEE, RICKMAN J., 19, Wimpole Street, W. (*C.* 1888-90.)

1889 GRANT, J. DUNDAS, M.D., 8, Upper Wimpole Street, W.

1887 GRIFFITH, THOMAS WARDROP, M.D. (*Council*), 23, Park Square, Leeds.

~~1887 GROVES, JAMES W., The Museum, King's College~~. R. 10/4/93.

1888 GUNN, DONALD, ~~62, Welbeck Street, and Ophthalmic Hospital, Moorfields~~. 66 Wimpole Street. W.

O.M. HARRIS, VINCENT D., M.D., ~~39~~ 36, Wimpole Street, W.

~~O.M. HARSANT, W. H., 16, Pembroke Road, Clifton, Bristol.~~ R. 7/4/93.

1889 HAUGHTON, Rev. SAMUEL, M.D., F.R.S., Trinity College, Dublin.

O.M. HENSMAN, ARTHUR, 31, Harley Street, Cavendish Square, W.

O.M. HEPBURN, DAVID, M.B., Anatomical Department, The University, Edinburgh. (*S.* 1887-9.)

O.M. HERRINGHAM, W. P., M.D. (*Council*), 13, Upper Wimpole Street, W. (*S.* 1889-91.)

O.M. HILL, ALEX., M.D. (*Council*), Downing College Lodge, Cambridge.

1888 HILL, W., M.B., 24, Wimpole Street, W.

O.M. HOWDEN, ROBERT, M.B. (*Council*), University of Durham; College of Medicine, Newcastle-on-Tyne.

O.M. HOWES, G. B. (*Treasurer*), Biological Laboratory, Royal College of Science, South Kensington Museum. (*C.* 1887-90.)

1891 HUGHES, A. W., M.D., Woodside, Musselburgh, N.B.

ELECTED.

O.M. Humphry, Sir Geo. M., M.D., LL.D., F.R.S., Grove Lodge, Cambridge. (*P.* 1887-90.)

O.M. Jackson, W. Hatchett, M.A., Keble College, Oxford.

O.M. Jessop, Walter, 73, Harley Street, W.

~~O.M. Jones, Lewis, M.D., 9, Upper Wimpole Street, W.~~

1892 Kanthack, A. A., M.B., ~~St. John's College, Cambridge.~~ 31 Rodney Street Liverpool

O.M. Kenny, Alexander S., King's College, London, W.C.

O.M. Klein, E., M.D., F.R.S., 19, Earl's Court Square, S.W.

O.M. Lane, Ernest, 55, Queen Anne Street, Cavendish Square, W.

O.M. Langton, John, 62, Harley Street, W. (*C.* 1887-90.)

1891 Lawrence, T. W. P., M.B., ~~138~~, Maida Vale, W.

~~1888 Lawson, Bernard, 12, Harley Street~~, W. D. Jan/93

O.M. Lockwood, C. B. (*Council*), 19, Upper Berkeley Street, W. (*S.* 1887-89.)

1889 Lucas, R. Clement, M.S. (*Council*), 18, Finsbury Square, E.C.

O.M. Macalister, Alex., F.R.S. (*Vice-President*), Harvey Road, Cambridge. (*C.* 1887-90.)

O.M. Mackay, J. Yule, M.D. (*Secretary for Scotland*), Demonstrator of Anatomy, The University, Glasgow.

O.M. Makins, George Henry (*Secretary for England*), 47, Charles Street, Berkeley Square, W.

1890 Marshall, C. D., University College, Gower Street, W.C.

~~O.M. Mears, W. P., M.D., University College of Medicine, Newcastle-upon-Tyne.~~

1889 Melsome, W. S., Queen's College, Cambridge.

~~1888 Mott, F. W., M.D., 84, Wimpole Street, W.~~ R. Nov 6th/93

1892 Openshaw, T. Horrocks, M.B., M.S., 16, Wimpole Street, Cavendish Square, W.

O.M. Oliver, M. J., M.B., ~~The Medical School, and 3, Park Square, Leeds.~~ Tweedmouth, Newtown St Boswells. N.B.

O.M. Page, Herbert Wm., M.B., 146, Harley Street, W.

1889 Parsons, F. G., St. Thomas's Hospital, S.E.

1893. Keith. A. McB. 3 Torrington Street. W.C.

1892. Kempson. F.C. B.A. 28 Rosetti Mansions Cheyne Walk. S.W.

1893 Lewis H. W. Westminster Hospital Me

1893. Musgrove James. Mrd. ~~to Lawrence~~ St Lawrence Cork. Edinburgh.

1893. Smith E. Barclay. M.B. Downing College
Cambridge

ELECTED.

1888 Paterson, A. M., M.D. (*Council*), University College, Dundee.

O.M. Pick, Thos. Pickering, 18, Portman Street, W. (*C.* 1887-90.)

~~O.M. Poland, John, 16, St. Thomas's Street, S.E.~~ Apr 19. 1893

1888 Pollard, Bilton, 24, Harley Street, W.

1887 Pye, J. P., M.D., Queen's College, Galway.

O.M. Ramsay, A. M., Demonstrator of Anatomy, The University, Glasgow.

1887 Redfern, Prof. (*Vice-President*), Queen's College, Belfast. (*C.* 1888-91.)

O.M. Reid, Prof. R. W. (*Council*), The University, and 8, Queen's Gardens, Aberdeen.

O.M. Robertson, Charles, Museum, and 105, Woodstock Road, Oxford.

1889 Robinson, Arthur, M.B., The Owens College, Manchester.

1892 Robinson, H. Betham, ~~59, Lambeth Palace Road, S.E.~~ 6 Mansfield St. Cavendish Square W.

O.M. Rolleston, H. D., M.D., 13, Upper Wimpole Street, W.

O.M. Roughton, E. W., M.D., 33, Westbourne Terrace, Hyde Park, W.

O.M. Shattock, S. G., St. Thomas's Hospital, S.E.

1891 Sherrington, C. S., M.D., 27, St. George's Square, S.W.

O.M. Shore, Thos. W., M.D., Warden's House, St. Bartholomew's Hospital, E.C.

1889 Smith, John W., M.B., ~~The Owens College,~~ Manchester. Royal Infirmary

1892 Smith, T. Manners, Queen's College, Birmingham.

O.M. Stewart, Charles (*Council*), Royal College of Surgeons, Lincoln's Inn Fields. (*T.* 1887-91.)

O.M. Stiles, H. J., M.B., Demonstrator of Anatomy, The University and 5, Castle Terrace, Edinburgh.

O.M. Stonham, C., 4, Harley Street, W.

O.M. Struthers, John, M.D. 24, Buckingham Terrace, Edinburgh. (*V.-P.* 1887, *C.* 1889-90.)

1891 Stuart, Prof. Anderson, University, Sydney.

ELECTED.

O.M. SUTTON, J. BLAND (*Council*), 48, Queen Anne Street, Cavendish Square, W. 19 College Gardens

O.M. SYMINGTON, J., M.D. (*Council*), ~~2, Greenhill Park, Edinburgh.~~ (*C.* 1887-90.) Leeds

~~1889 TAYLOR, SEYMOUR, M.D., 16, Seymour Street, Portman Square, W.~~ Ap. 13. 1898

O.M. THANE, GEO. D. (*Council*), University College, Gower Street, W.C. (*V.-P.* 1888-91.)

O.M. THOMSON, A., M.B. (*Council*), The Museum, and ~~5, Polstead~~ Road, Oxford. 159 Woodstock

1888 THOMSON, D'ARCY, University College, Dundee.

1889 THOMSON, D. WM., ~~Trinity College~~, Dublin. 20 Lower Baggot Street

1888 TORRENS, J., M.D., 32, Harcourt Street, Dublin.

~~O.M. TREVES, F., 6, Wimpole Street, Cavendish Square, W. (*C.* 1887-91.)~~ R. 6/11/93

O.M. TURNER, G. R., 49, Green Street, Park Lane, W.

O.M. TURNER, Sir WILLIAM, F.R.S. (*President*), 6, Eton Terrace, Edinburgh. (*C.* 1887, *V.-P.* 1888-90.)

1888 WALLIS, F., M.B., ~~18, St. James's Street, Piccadilly~~, W. 26 Welbeck Street

O.M. WALSHAM, W. J., 27, Weymouth Street, W. 81 Wimpole Street W.

1891 WATERHOUSE, HERBERT, ~~Charing Cross Hospital, W.C.~~

~~O.M. WILLETT, EDGAR, M.A., M.B., 25, Welbeck Street, Cavendish Square, W.~~ R 6/11/93

1887 WILLIAMS, CAMPBELL, 62, Welbeck Street, W. 24

1890 WILSON, J. T., The University College, Sydney, New South Wales.

O.M. WINDLE, B. C. A., M.D. (*Council*), ~~Queen's~~ College, Birmingham. Mason

1890 WITHERS, F. E., St. Bartholomew's Hospital, E.C.

1891 YEARSLEY, PERCIVAL MCCLEOD, Chalk Hill House, Kingsbury, N.W.

O.M. YOUNG, A. H., M.B. (*Council*), Owens College, Manchester.

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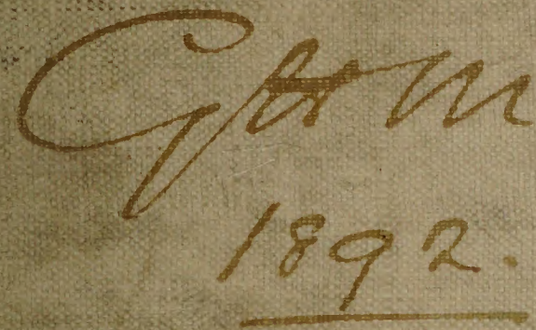
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